FINAL REGISTRATION REPORT

Part B

Section 8

Environmental Fate

Detailed summary of the risk assessment

Product code: A18385B

Product name: SPANDIS

Chemical active substances:

Dicamba, 400 g/kg
Nicosulfuron, 100 g/kg
Prosulfuron, 40 g/kg

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

(new authorization)

Applicant: Syngenta

Submission date: xx/11/2020

MS Finalisation date: 11/07/2022

Version history

When	What
February 2021	Dossier sent for evaluation
September 2021	Updates based on feedback from zRMS Poland
November 2021	Updates based on feedback from zRMS Poland
December 2021	Updates based on feedback from zRMS Poland
February 2022	Updates based on feedback from zRMS Poland
April 2022	zRMS evaluation of dRR
May 2022	Comments from applicant on dRR evaluation from zRMS: Updates on dicamba modelling of $PEC_{SW/SED}$ (Step 3)
July 2022	Final version prepared by zRMS after Commenting period

Table of Contents

zRMS comments:
The text highlighted in grey was provided by the evaluator.

8 Fate and behaviour in the environment (KCP 9)

8.1 Critical GAP and overall conclusions

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

1	2	3	4	5	6	7	8	9	10	11			12	13	14	15
Use-No (e)	Member state(s)	Crop and/ or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**					PHI (days)	Remarks: e.g. g safener/synergist per ha (f)	**Conclusion**
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg A18385B/ ha a) max. rate per appl. b) max. total rate per crop/season	g prosulfuron/ha a) max. rate per appl. b) max. total rate per crop/season	g nicosulfuron/ha a) max. rate per appl. b) max. total rate per crop/season	g dicamba/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max			Groundwater
1	PL	Maize	F	Annual/ perennial broad leave weeds and grasses	Foliar spray	BBCH 12-18	1 (1 appl. every 3rd year)	N/A	a) 0.4 b) 0.4	a) 16 b) 16	a) 40 b) 40	a) 160 b) 160	200-400		tank-mixed oil-based adjuvant needed (e.g Adigor@ 1.0-1.5L/ha)	
2	PL	Maize	F	Annual/ perennial broad leave weeds and grasses	Foliar spray	BBCH 12-18	1 (1 appl. every 3rd year)	N/A	a) 0.5 b) 0.5	a) 20 b) 20	a) 50 b) 50	a) 200 b) 200	200-400		tank-mixed oil-based adjuvant needed (e.g Adigor@ 1.0-1.5L/ha)	

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

** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

Explanation for column 15 "Conclusion"

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

The safe use can be concluded if formulation is applied every third year.

Remarks table:

(1) Numeration necessary to allow references
(2) Use official codes/nomenclatures of EU
(3) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(4) F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application
(5) Scientific names and EPPO-Codes of target pests/diseases/ weeds or when relevant the common names of the pest groups (e.g. biting and sucking insects, soil born insects, foliar fungi, weeds) and the developmental stages of the pests and pest groups at the moment of application must be named
(6) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(7) Growth stage at first and 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
(8) The maximum number of application possible under practical conditions of use must be provided
(9) Minimum interval (in days) between applications of the same product.
(10) For specific uses other specifications might be possible, e.g.: g/m³ in case of fumigation of empty rooms. See also EPPO-Guideline PP 1/239 Dose expression for plant protection products
(11) The dimension (g, kg) must be clearly specified. (Maximum) dose of a.s. per treatment (usually g, kg or L product / ha).
(12) If water volume range depends on application equipments (e.g. ULVA or LVA) it should be mentioned under “application: method/kind”.
(13) PHI - minimum pre-harvest interval
(14) Remarks may include: Extent of use/economic importance/restrictions

Table 8.1-2: Assessed (critical) uses during approval of prosulfuron concerning the Section Environmental Fate

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No *	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I **	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	Application				Application rate			PHI (days)	Remarks: e.g. g safener / synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg or L product/ha a) max. rate per appl. b) max. total rate per crop/season	g a.s./ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max		
-	EU	Maize and sweet corn	F	Broad leaved weeds as cited on label	Broadcast foliar application	BBCH 12-18	1	-		20	80-400	90 (grain) 60 (silage)	In combination with a nonionic surfactant at 0.1% to 0.25% of application volume
1	EU	Maize and sweet corn	F	Broad leaved weeds as cited on label	Broadcast foliar application	BBCH 12-18 (19)[a]	1(-2)[a]	-		15 (total)	80-400	90 (grain) 60 (silage)	In combination with a nonionic surfactant at 0.1% to 0.25% of application volume

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1
** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application
(a) One application, or two applications divided in first application at 0.0075 kg a.s./ha (up to BBCH 16), and second application at 0.0075 kg a.s./ha (at BBCH 18-19)

Table 8.1-3: **Assessed (critical) uses during approval of nicosulfuron concerning the Section Environmental Fate**

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No *	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I **	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			PHI (days)	Remarks: e.g. g safener / synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	g a.s./hL min – max	g a.s./ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max		
1	Various	Maize	F	Weeds	Spray application	BBCH 12-18	1	n.a.	15-30	60	200-400	n.r.	-

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

** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

Table 8.1-4: Assessed (critical) uses during approval of dicamba concerning the Section Environmental Fate

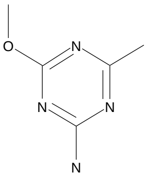
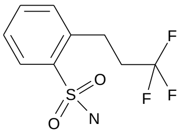
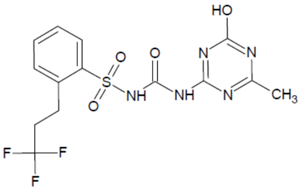
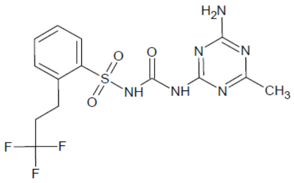
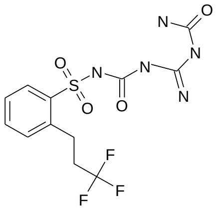
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No *	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I **	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			PHI (days)	Remarks: e.g. g safener / synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg or L product/ha a) max. rate per appl. b) max. total rate per crop/season	g a.s./ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max		
1	EU (N & S)	Maize	F	Dicotyledon weeds incl. Chenopodium spp. Convolvulus spp. Polygonum spp.	Overall spray	Post-emergence until BBCH 16	1	-	-	360	100 - 500	-	Period between treatment and harvest is > 100 days, no PHI is applicable
2	EU (N & S)	Pasture	F	Dicotyledon weeds incl. Chenopodium spp. Convolvulus spp. Polygonum spp.	Overall spray	Spring/summer	1 -2	6 weeks	-	480	100 - 500	14	

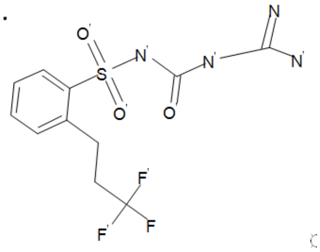
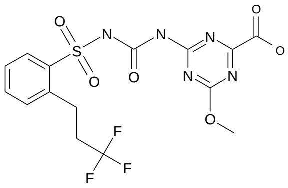
* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1

** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

8.2 Metabolites considered in the assessment

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

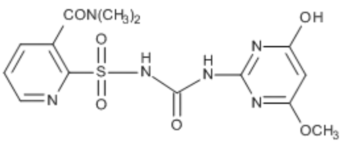
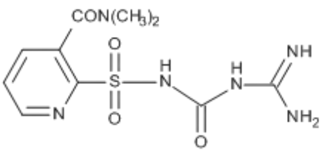
Metabolite	Molar mass (g/mol)	Chemical structure	Maximum observed occurrence in compartments (%)	Exposure assessment required due to
CGA150829 prosulfuron triazine amine	140.1		Soil: > 10 % of a.s. Water: > 10 % of a.s. (aquatic hydrolysis) Water/sediment: > 5 % of a.s.	PEC_{gw}: not covered by EU assessment PEC_{s}: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment
CGA159902 prosulfuron phenyl sulfonamide	253.2		Soil: > 10 % of a.s. Water: > 10 % of a.s. (aquatic hydrolysis) Sediment: > 10 % of a.s. Water/sediment: > 10 % of a.s.	PEC_{gw}: not covered by EU assessment PEC_{s}: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment
CGA300406 O-desmethyl-prosulfuron	405.4		Soil: > 10 % of a.s. Water: > 10 % of a.s. Sediment: > 10 % of a.s.	PEC_{gw}: not covered by EU assessment PEC_{s}: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment
CGA325025 demethoxy amino-prosulfosulfuron	404.4		Soil: > 10 % of a.s. Water/sediment: > 5 % of a.s.	PEC_{gw}: not covered by EU assessment PEC_{s}: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment
SYN542604	381.3		Soil: > 10 % of a.s. Water/sediment: > 10 % of a.s.	PEC_{gw}: not covered by EU assessment PEC_{s}: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment

Metabolite	Molar mass (g/mol)	Chemical structure	Maximum observed occurrence in compartments (%)	Exposure assessment required due to
CGA349707	338.3		Soil: > 10 % of a.s. Water/sediment: > 10 % of a.s.	PEC_{gw}: not covered by EU assessment PEC_{s}: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment
SYN547308	449.4		Soil: > 5 % of a.s. and maximum of formation not yet reached at the end of the study Water: < 5 % Sediment: < 5 %	PEC_{gw}: not covered by EU assessment PEC_{s}: not covered by EU assessment

In the review report for the active substance prosulfuron (SANTE/10682/2015 Rev 3, 24. January 2017) it is referred to the EFSA conclusion of prosulfuron that considered the groundwater risk assessment for the unidentified metabolite M17 as not finalized (EFSA Journal 2014;12(9):3815; Prosulfuron, EFSA Journal 2020;18(7):6181).

The expert meeting acknowledged the extensive work undertaken in trying to identify M17 and agreed that it was technically not feasible to identify the metabolite. No further analytical work was required to be undertaken (***as recorded in updated RAR June 2014 page 30***) and the metabolite could remain as an unknown. However, information to address the groundwater leaching risk was still expected. The SANCO guidance is not clear on what to do in situations when the metabolites cannot be identified. However, an initial assessment has been made to provide a quantitative groundwater assessment for M17 using assumptions and a weight of evidence of information available to aid decision making.

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

Metabolite	Molar mass (g/mol)	Chemical structure	Maximum observed occurrence in compartments (%)	Exposure assessment required due to
HMUD	396.4		Soil: > 10 % of a.s. Water: > 10 % of a.s. Sediment: > 5 % of a.s. in 2 sequential measurements	PEC_{GW}: not covered by EU assessment PEC_{S}: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment
AUSN	314.3		Soil: > 10 % of a.s. Water: > 5 % of a.s. and maximum of formation not yet reached at the end of the study	PEC_{GW}: not covered by EU assessment PEC_{S}: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment

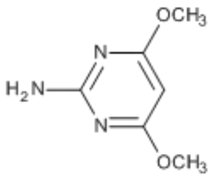
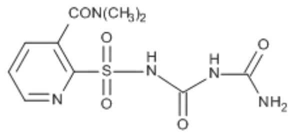
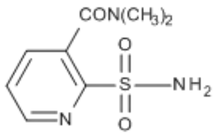
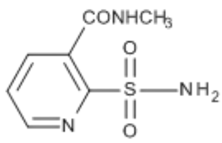
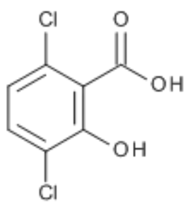
Metabolite	Molar mass (g/mol)	Chemical structure	Maximum observed occurrence in compartments (%)	Exposure assessment required due to
			Sediment: < 5 % of a.s.	
ADMP	155.2		Soil: > 5 % of a.s. in 2 sequential measurements Water: < 5 % of a.s. Sediment: < 5 % of a.s.	PEC_{GW}: not covered by EU assessment PEC_S: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment
UCSN	315.3		Soil: > 10 % of a.s. Water: > 5 % of a.s. and maximum of formation not yet reached at the end of the study Sediment: < 5 % of a.s.	PEC_{GW}: not covered by EU assessment PEC_S: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment
ASDM	229.2		Soil: > 10 % of a.s. Water: > 5 % of a.s. and maximum of formation not yet reached at the end of the study Sediment: < 5 % of a.s.	PEC_{GW}: not covered by EU assessment PEC_S: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment
MU-466	215.1		Soil: > 0.1 µg/L in lysimeter leachate Water: < 5 % of a.s. Sediment: < 5 % of a.s.	PEC_{GW}: not covered by EU assessment

Table 8.2-3: Metabolites of dicamba potentially relevant for exposure assessment

Metabolite	Molar mass (g/mol)	Chemical structure	Maximum observed occurrence in compartments (%)	Exposure assessment required due to
DCSA (NOA414746)	207		Soil: > 10 % of a.s. Water: > 10 % of a.s. Sediment: < 5 % of a.s.	PEC_{GW}: not covered by EU assessment PEC_S: not covered by EU assessment $PEC_{SW/SED}$: not covered by EU assessment

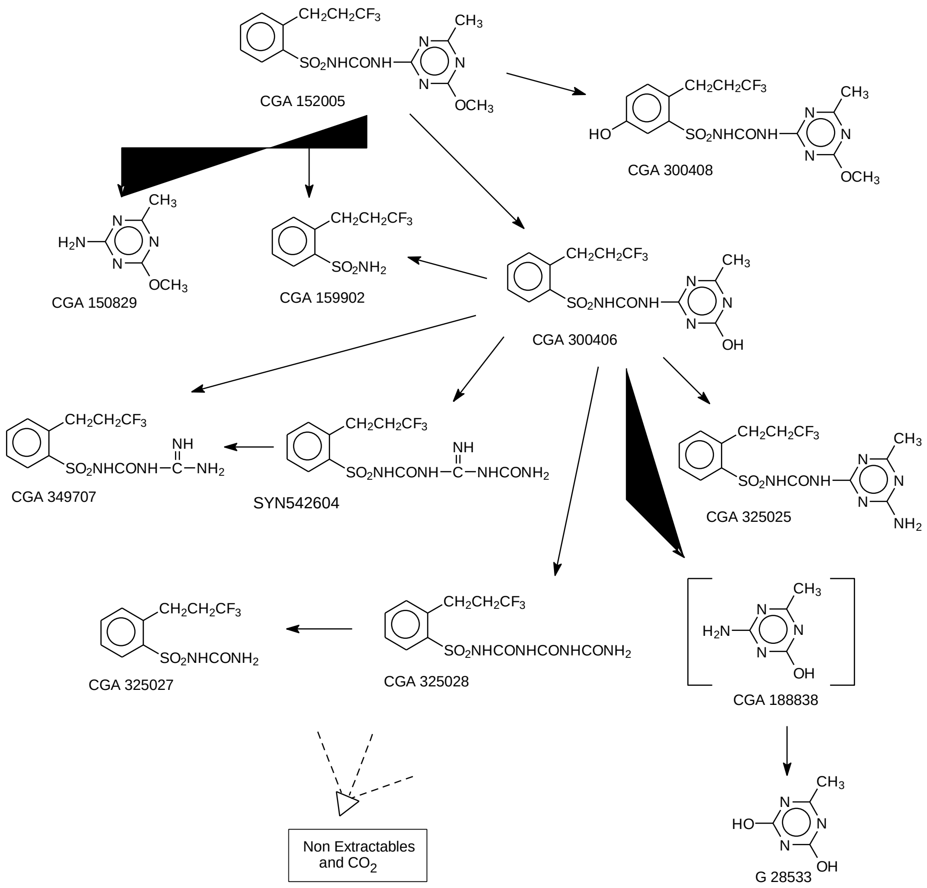
8.3 Rate of degradation in soil (KCP 9.1.1)

Prosulfuron

As illustrated in the Table 8.2-1, the major prosulfuron metabolites in soil are CGA150829, CGA159902, CGA300406, SYN542604, CGA349707 and CGA325025. An additional metabolite SYN547308 (M18) was identified during the risk assessment of prosulfuron. The new metabolite was acknowledged in the EFSA conclusion (EFSA Journal 2014;12(9):3815; Prosulfuron, EFSA Journal 2020;18(7):6181). However, no degradation and adsorption data of this metabolite were available.

The new metabolite SYN547308 was considered based on the new degradation and adsorption studies by Patel (2014)[1] and Crabtree (2014)[2]. The degradation study is summarised in Appendix A 2.1 and the adsorption study in Appendix A 2.4. All other metabolites shown in the degradation pathway of prosulfuron in soil (see Figure 8.3-1) are considered to be minor metabolites.

Figure 8.3-1: Proposed pathway of prosulfuron in soil



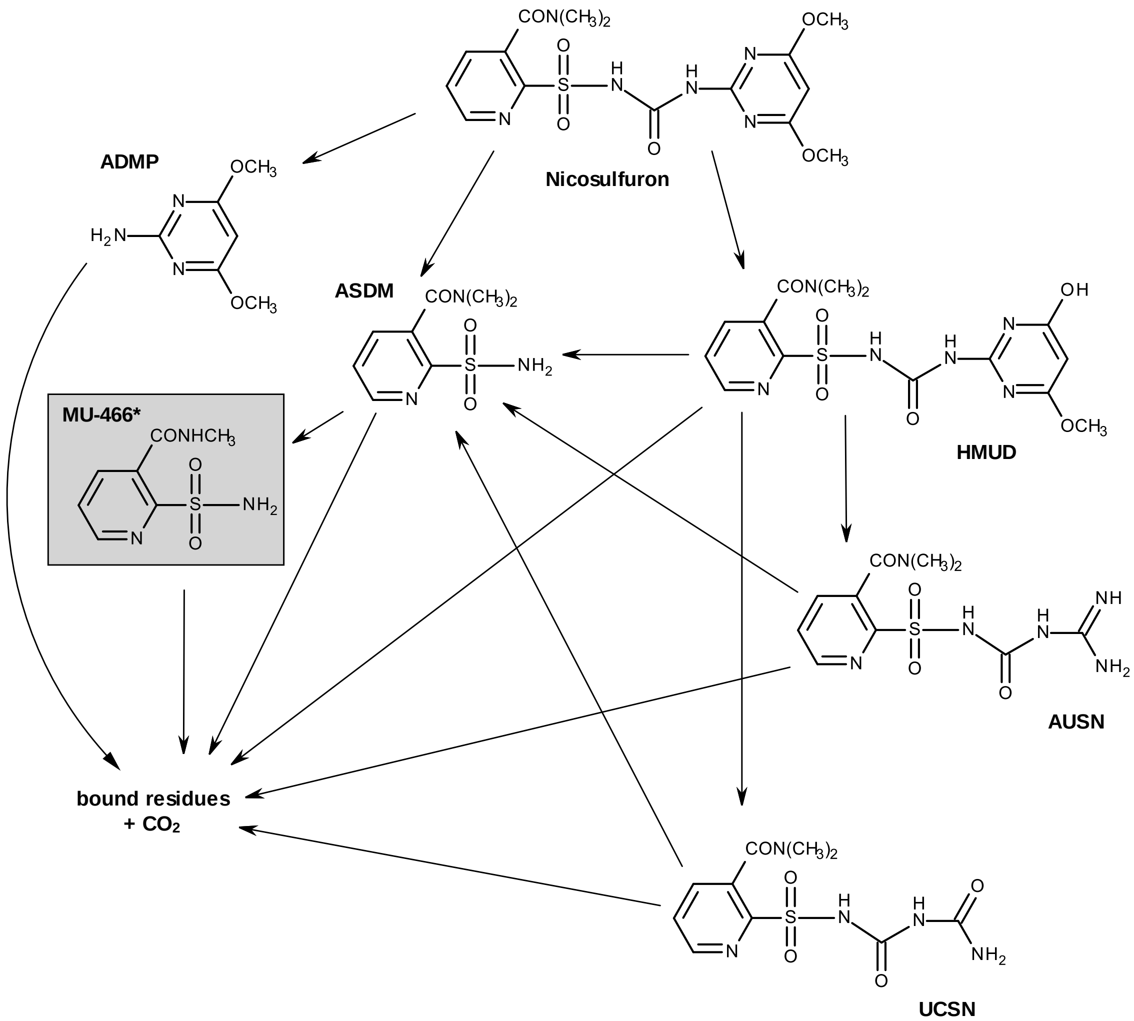
[1] Patel, M (2014): Prosulfuron – Laboratory Degradation Kinetics for Modelling Endpoints for the soil metabolite SYN547308-Final Report. Syngenta Agrochemicals Report No RAJ1065B. Syngenta File No SYN547308_10009

[2] Crabtree, GA (2014): SYN547308 - Adsorption and Desorption Properties of 14C-SYN547308, a Metabolite of Prosulfuron - Final Report. Syngenta File No SYN547308_10010

Nicosulfuron

As illustrated in Table 8.2-2, the major nicosulfuron metabolites in soil are HMUD, AUSN, ADMP, UCSN and ASDM. All other metabolites shown in the degradation pathway of nicosulfuron in soil (Figure 8.3-2) are considered to be minor metabolites.

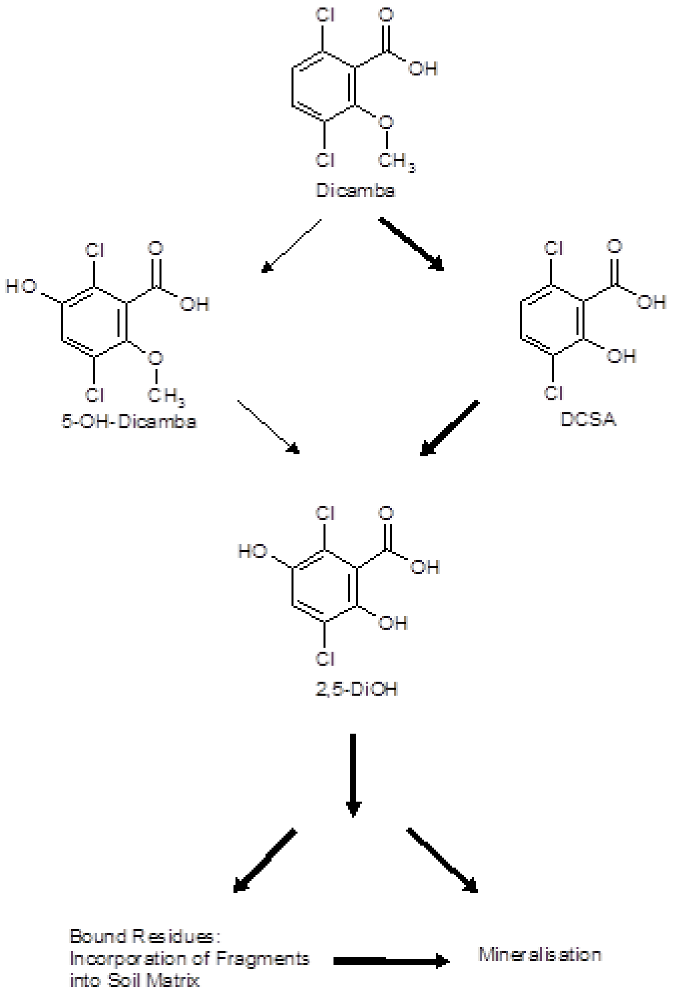
Figure 8.3-2: Proposed pathway of nicosulfuron in soil



Dicamba

As illustrated in Table 8.2-3, the major dicamba metabolite in soil is DCSA. All other metabolites shown in the degradation pathway of dicamba in soil (Figure 8.3-3) are considered to be minor metabolites.

Figure 8.3-3: Proposed pathway of dicamba in soil



8.3.1 Aerobic degradation in soil (KCP 9.1.1.1)

8.3.1.1 Prosulfuron and its metabolites

Studies on the aerobic degradation rates of prosulfuron and its metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707 and CGA325025 are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of prosulfuron (Prosulfuron, EFSA Journal 2014; 12(9): 3815; Prosulfuron, EFSA Journal 2020;18(7):6181).

An additional metabolite SYN547308 (M18) was identified during the risk assessment of prosulfuron. The new metabolite was acknowledged in the EFSA conclusion (EFSA, 2014). However, no degradation data of this metabolite was available. New degradation data on the metabolite SYN547308 study was presented in a study by Patel (2014)[1]. These data have been provided in Appendix 2 of this document (A 2.1).

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

Prosulfuron, Laboratory studies, aerobic conditions										
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi[2] (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
18 Acres (phenyl)	Sandy clay loam	5.84	20	pF2	22.5	74.7	22.5	7.2	SFO	Yes / EFSA, 2014
18 Acres (triazine)	Sandy clay loam	5.84	20	pF2	18.9	62.8	18.9	9.8	SFO	
18 Acres (triazine)	Sandy clay loam	5.84	20	pF2	21.0	69.9	21.0	8.3	SFO	
Geometric mean 18 Acres (n=3)							20.8			
Vétroz (triazine)	Loam	7.77	20	pF2	41.3	137	41.3	2.4	SFO	
Krone (triazine)	Silt loam	5.38	20	pF2	15.4	51.1	15.4	9.3	SFO	
Nebraska (triazine)	Silt loam	6.61	20	pF2	61.1	203	61.1	6.9	SFO	
Fayette (phenyl)	Sandy loam	6.6	25	75% FC	88.9	295	106	8.4	SFO	
Fayette (triazine)	Sandy loam	6.6	25	75% FC	192	639	229	3.3	SFO	
Geometric mean Fayette (n=2)							156			
Madison (phenyl)	Sandy loam	6.1	25	75% FC	143	476	142	4.6	SFO	
Madison (triazine)	Sandy loam	6.1	25	75% FC	124	410	122	4.0	SFO	
Geometric mean Madison (n=2)							131			
Neuhofen (phenyl)	Loamy sand	6.6	20	40% MWHC	177	589	124	3.6	SFO	
Collombey (phenyl)	Loamy sand / sand	7.2	20	40% MWHC	138	459	98.2	5.2	SFO	
Stein (phenyl)	Sandy loam / loam	7.0	20	40% MWHC	198	657	132	3.2	SFO	
Les Evouettes (phenyl)	Silt loam	7.3	20	40% MWHC	74.3	247	47.2	5.6	SFO	
Les Evouettes (phenyl)	Silt loam	7.0	20	60% FC	24.4	80.9	21.9	7.2	SFO	
Geometric mean Les Evouettes (n=2)							32.2			
Geometric mean (n=10)							**62.1[b]**			

Prosulfuron, Laboratory studies, aerobic conditions										
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi[2] (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
						Median (n=10)	**79.7[b]**			
						pH-dependency:	No			

[a] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
[b] Geometric mean of replicate soils calculated first

Table 8.3-2: Summary of aerobic degradation rates for CGA150829 - laboratory studies

CGA150829, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction (-)**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi[2] (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
18 Acres (phenyl)	Sandy clay loam	5.84	20	pF2	295	979	0.36	295	10.4	SFO	~~Yes / EFSA, 2014~~ Yes / EFSA, 2020
18 Acres (triazine)	Sandy clay loam	5.84	20	pF2	228	757	0.28	228	2.9	SFO	
Vétroz (triazine)	Loam	7.77	20	pF2	61.9	205	0.11	61.9	16.8	SFO	
Krone (triazine)	Silt loam	5.38	20	pF2	>1000	>1000	0.45	1000	7.3	SFO	
Nebraska (triazine)	Silt loam	6.61	20	pF2	>1000	>1000	0.26	1000	22.4	SFO	
18 Acres	Sandy clay loam	5.0	20	pF2	~~250~~ 249	~~830~~ 828	-	~~250~~ 249	~~3.2~~ 1	SFO	
Gartenacker	Loam	6.9	20	pF2	102	339	-	102	3.3	SFO	
Krone	Silt loam	4.9	20	pF2	191	634	-	191	3.7	SFO	
Honville	Loamy silt	6.7	20	40% MWHC	113.6	717.6	-	~~260.1[b]~~ 201.6[b]	3.03	HS[e]	
Arrow	Sandy loam	5.7	20	50% MWHC	44.7	97.0	-	22.5[c]	14	HS[f]	
Fayette	Sandy loam	6.6	25	75% FC	>1000	>1000	0.17	1000	17.1	SFO	
Madison	Sandy loam	6.1	25	75% FC	>1000	>1000	0.38	1000	17.9	SFO	
Keyport	Silt loam	4.3	25	70% FC	208	691	-	254	6.2	SFO	~~Yes / EFSA, 2014*~~ Yes / EFSA, 2020*
Soil 2.2	Loamy sand	5.7	20	45% MWHC	~~67.3~~ 60.5	~~224~~ 285	-	~~67.3~~ 67.5	5.68	SFO	
Soil 3A	Sandy loam	7.3	20	45% MWHC	~~188.4~~ 280.4	~~626~~ >1000	-	~~175.7~~ 385[c]	~~5.64~~ 2	~~SFO~~ HS[g]	

CGA150829, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction (-)**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi[2] (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
Soil 6S	Clay loam	7.1	20	45% MWHC	333.2	1107	-	230.1	1	SFO	
Speyer 2.1	Sand	5.5	20	pF2	112.5	374	-	112.5	2.9	SFO	Yes / EFSA, 2014**
Soil 115	Clay loam	8.6	20	pF2	175.2	582	-	175.2	3.1	SFO	
Soil 243	Sandy loam	5.6	20	pF2	96.4	320.2	-	96.4	6.2	SFO	
Median (n=18)							-	~~**196[d]**~~ **215.7[d]**			
Arithmetic mean (n=6)							**0.28[d]**	-			
pH-dependency:							No				

[a] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
[b] Calculated from slow phase ($\ln(2)/k_2$); non-normalised value used for mean calculation as worst case (validation of normalisation not possible)
[c] Calculated from slow phase ($\ln(2)/k_2$)
~~[d] Geometric/arithmetic mean of replicate soils calculated first (18 Acres (pH 5.84) 259 days / ffM 0.32) The median soil DT50 used in the available exposure assessment was 259 days, which was derived from the 11 soil DT50 values available before the inclusion of the additional data accepted in the peer review of other sulfunyl urea active substances (i.e. thifensulfuron methyl and metsulfuron methyl) and the correction of the normalised DT50 value for the Honville soil, for which the validation of the normalisation procedure was originally considered not possible.~~
[d] Geometric/arithmetic mean of replicate soils calculated first (18 Acres (pH 5.84) 259 days / ffM 0.32).
[e] k_1=0.01772, k_2=0.00266, t_b=25.93434
[f] k_1=0 (fixed; lag phase), k_2=0.03082, t_b=22.25
[g] k_1=0.013, k_2=0.002, t_b=20
* Metabolite dosed studies, accepted in the RAR for the active substance thifensulfuron-methyl. DT50 values not used in the available exposure assessment by EFSA (see EFSA, ~~2014~~ 2020)
** Metabolite dosed studies, accepted in the RAR for the active substance metsulfuron methyl. DT50 values not used in the available exposure assessment by EFSA (see EFSA, 2014)

Table 8.3-3: Summary of aerobic degradation rates for CGA159902 - laboratory studies

CGA159902, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi[2] (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
18 Acres (phenyl)	Sandy clay loam	5.84	20	pF2	90.6	301	0.36	90.6	16.4	SFO	Yes / EFSA, 2020 ~~2014~~
18 Acres	Sandy clay loam	5.0	20	pF2	7.5	373	-	173[b]	5.3	DFOP[c]	
Gartenacker	Loam	6.9	20	pF2	3.1	140	-	169[b]	11.3	HS[d]	
Krone	Silt loam	4.9	20	pF2	89.7	298	-	89.7	8.9	SFO	
Fayette	Sandy loam	6.6	25	75% FC	>1000	>1000	0.49	1000	9.1	SFO	

CGA159902, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi[2] (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
						Geometric mean (n=5)	**-**	**188**			
						Arithmetic mean (n=2)	**0.43**	**-**			
						pH-dependency:	No				

[a] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
[b] Calculated from slow phase ($\ln(2)/k_2$))
[c] k_1=0.2796, k_2=0.0040, g=0.5553
[d] k_1=0.2256, k_2=0.0041, t_b=7.8046

Table 8.3-4: Summary of aerobic degradation rates for CGA300406 - laboratory studies

CGA300406, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi[2] (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
18 Acres (phenyl)	Sandy clay loam	5.84	20	pF2	4.3	13.3	0.48	4.3	25.4	SFO	Yes / EFSA, 2014
18 Acres (triazine)	Sandy clay loam	5.84	20	pF2	4.0	14.4	0.40	4.0	20.9	SFO	
18 Acres (triazine)	Sandy clay loam	5.84	20	pF2	4.1	13.7	0.51	4.1	10.5	SFO	
Vétroz (triazine)	Loam	7.77	20	pF2	25.4	84.4	0.56	25.4	10.0	SFO	
Krone (triazine)	Silt loam	5.38	20	pF2	2.6	8.8	0.29	2.6	29.6	SFO	
Les Evouettes (phenyl)	Silt loam	7.3	20	pF2	47.5	158	0.46	30.2	11.3	SFO	
Les Evouettes (phenyl)	Silt loam	7.0	20	pF2	23.3	77.5	0.68	21.0	14.0	SFO	
						Geometric mean (n=4)	**-**	**9.1[b]**			
						Arithmetic mean (n=4)	**0.47[b]**	**-**			
						Maximum (acidic soils)	**-**	**4.3**			
						Maximum (alkaline soils)	**-**	**30.2**			
						pH-dependency:	Yes				

[a] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
[b] Geometric/arithmetic mean of replicate soils calculated first (18 Acres 4.1 days/ 0.46; Les Evouettes 25.2 days/ 0.57)

Table 8.3-5: Summary of aerobic degradation rates for CGA325025 - laboratory studies

CGA325025, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi^2 (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
18 Acres	Sandy clay loam	5.0	20	pF2	50.1	167	-	50.1	5.7	SFO	Yes / EFSA, 2014
Gartenacker	Loam	6.9	20	pF2	102	340	-	102	7.0	SFO	
Krone	Silt loam	4.9	20	pF2	47.4	157	-	47.4	6.9	SFO	
Geometric mean (n=4)							**-**	**62.4**			
Arithmetic mean (n=6)							**0.12[b]**	**-**			
pH-dependency:							No				

[a] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
[b] Assumed ffm from O-DESMETHYL-PROSULFURON (CGA300406), calculated by (1-ffM_SYN542604)

Table 8.3-6: Summary of aerobic degradation rates for SYN542604 - laboratory studies

SYN542604, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi^2 (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
18 Acres (phenyl)	Sandy clay loam	5.84	20	pF2	150	499	1.00	150	2.6	SFO	Yes / EFSA, 2014
18 Acres (triazine)	Sandy clay loam	5.84	20	pF2	142	472	1.00	142	6.1	SFO	
18 Acres (triazine)	Sandy clay loam	5.84	20	pF2	184	611	0.73	184	3.8	SFO	
Vétroz (triazine)	Loam	7.77	20	pF2	61.5	204	0.87	61.5	19.6	SFO	
Krone (triazine)	Silt loam	5.38	20	pF2	125	415	1.00	125	5.5	SFO	
Nebraska (triazine)	Silt loam	6.61	20	pF2	118	391	1.00	118	8.5	SFO	
Les Evouettes (phenyl)	Silt loam	7.3	20	40	81.9	272	0.66	52.0	17.5	SFO	
Les Evouettes (phenyl)	Silt loam	7.0	20	60% FC	56.6	188	0.54	51.0	9.6	SFO	
18 Acres	Sandy clay loam	5.0	20	pF2	102	340	-	102	6.0	SFO	

SYN542604, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi^2 (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
Gartenacker	Loam	6.9	20	pF2	25.0	83.2	-	25.0	9.8	SFO	
Krone	Silt loam	4.9	20	pF2	140	464	-	140	6.1	SFO	
Geometric mean (n=8)							**-**	**84.6[b]**			
Arithmetic mean (n=5)							**0.88[b]**	**-**			
pH-dependency:							No				

[a] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
[b] Geometric/arithmetic mean of replicate soils calculated first (18 Acres (pH 5.84) 158 days / 0.91; Les Evouettes 51.5 days / 0.60)

Table 8.3-7: Summary of aerobic degradation rates for CGA349707 - laboratory studies

CGA349707, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction**	**DT_{50} (d) 20°C pF2/10kPa[a]**	**Chi^2 (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
18 Acres	Sandy clay loam	5.0	20	pF2	113	376	-	113	2.8	SFO	Yes / EFSA, 2014
Gartenacker	Loam	6.9	20	pF2	91.9	305	-	91.9	3.0	SFO	
Krone	Silt loam	4.9	20	pF2	140	466	-	140	2.2	SFO	
Les Evouettes (phenyl)	Silt loam	7.3	20	40	331	>1000	1.00	210	10.6	SFO	
Les Evouettes (phenyl)	Silt loam	7.0	20	60% FC	737	>1000	0.72	663	7.8	SFO	
Geometric mean (n=7)								**153[b]**			
Arithmetic mean (n=2)							**0.86[b]**				
pH-dependency:							No				

[a] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
[b] Geometric mean of replicate soils calculated first (Les Evouettes 373 days)

Table 8.3-8: Summary of aerobic degradation rates for SYN547308 - laboratory studies

SYN547308, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)[a]**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction**	**DT_{50} (d) 20°C pF2/10kPa'**	**Chi^2 (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
Vetroz	Loam	8.3	20	pF2	174	654	-	207	1.18	DFOP k2	~~No / Patel, 2014~~[b] Yes / EFSA, 2020
18 Acres	Sandy clay	6.5	20	pF2	17.6	120	-	36.4	3.77	FOMC (DT_{90}/	

SYN547308, Laboratory studies, aerobic conditions											
Soil name	**Soil type (USDA)**	**pH (H_2O)[a]**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction**	**DT_{50} (d) 20°C pF2/10kPa**	**Chi[2] (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
	loam									3.32)	
Krone	Silt loam	6.0	20	pF2	7.79	133	-	40.1	2.40	FOMC (DT_{90}/ 3.32)	
Geometric mean (n=3)								**67.1**			
pH-dependency:							No				

[a] pH values taken from Gilbert (2014): Prosulfuron – Rate of Degradation of [14C]-SYN547308 - Final report. Report No: 3200460. Syngenta File No SYN547308_10008.
[b] Data have been provided in Appendix 2 of this document (A 2.1).

zRMS Comments:	The submitted data for active substance and its metabolites except SYN547308 were agreed at the EU level. Metabolite SYN547308. The new study was submitted and evaluated during substance renewal (Prosulfuron_AIR_Volume 3_B8_ Revised_2019-02). The DT_{50} =67.1 d can be used in modelling. These values will be used in further exposure assessment.

8.3.1.2 Nicosulfuron and its metabolites

Studies on the aerobic degradation rates of nicosulfuron and its metabolites HMUD, AUSN, ADMP, UCSN, ASDM and MU-466 are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007);120, 1-91).

Table 8.3-9: Summary of aerobic degradation rates for nicosulfuron - laboratory studies

Nicosulfuron, Laboratory studies, aerobic conditions										
Soil name (Label)	**Soil type**	**pH**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Le Noron (pyridine)	Loam	5.3	20	46.3	20.0	66.4[a]	13.3	0.986	1st order non-linear	Yes / EFSA, 2007
Le Noron (pyrimidine)	Loam	5.3	20	46.3	26.3	87.4[a]	17.4	0.901	1st order non-linear	
Mean							**15.3**			
Les Evouettes (pyridine)	Silt loam	6.1	20	54.6	40.5	134.4[a]	33.2	0.981	1st order non-linear	Yes / EFSA, 2007
Les Evouettes (pyrimidine)	Silt loam	6.1	20	54.6	33.1	110.1[a]	27.1	0.993	1st order non-linear	
Mean							**30.1**			

Nicosulfuron, Laboratory studies, aerobic conditions										
Soil name (Label)	**Soil type**	**pH**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Speyer 2.1 (pyridine)	Sand	6.0	20	21.1	35.1	116.6[a]	30.6	0.989	1st order non-linear	Yes / EFSA, 2007
Speyer 2.1 (pyrimidine)	Sand	6.0	20	21.1	46.3	154.0[a]	40.4	0.974	1st order non-linear	
Mean							**35.5**			
Speyer 2.3 (pyridine)	Sandy loam	6.6	20	31.4	26.7	88.8[a]	20.3	0.985	1st order non-linear	Yes / EFSA, 2007
Speyer 2.3 (pyrimidine)	Sandy loam	6.6	20	31.4	23.2	77.2[a]	17.7	0.992	1st order non-linear	
Mean							**19.0**			
Pappelacker (pyrimidine)	Loamy sand	7.0	20	40	7.0	23.4[b]	**5.7**	0.960	SFO	Yes / EFSA, 2007
Karolinenhof (pyrimidine)	Sand	7.2	20	40	13.2	43.9[b]	**12.6**	0.992	SFO	
Otzberg (pyrimidine)	Silt loam	7.2	20	40	18.9	62.8[b]	**14.3**	0.991	SFO	
Geometric mean (n= 7)							16.4			
pH-dependency:							No			

Values in bold used to calculate geometric mean DT_{50}
[a] Values from DAR, 2006 (see EFSA, 2007)
[b] Values from report A39791 - Mamouni, 2006 (see EFSA, 2007)

Table 8.3-10: Summary of aerobic degradation rates for HMUD - laboratory studies

HMUD, Laboratory studies, aerobic conditions											
Soil name (Label)	**Soil type**	**pH**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction kdp/kf**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Les Evouettes (pyridine)	Silt loam	6.1	20	54.6	30.8	102.2	0.00752	25.2	0.983	Modelmaker based on SFO formation and decline from parent	Yes / EFSA, 2007
Les Evouettes (pyrimidine)	Silt loam	6.1	20	54.6	27.4	90.0	0.00786	22.4	0.930	Modelmaker based on SFO formation and decline from parent	

HMUD, Laboratory studies, aerobic conditions											
Soil name (Label)	**Soil type**	**pH**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction kdp/kf**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Geometric mean (n=2)[a]							**-**	**23.8**			
pH-dependency:								No			

[a] The DT_{50} for HMUD are 2 values from 2 parent labels for 1 soil. Whereas, for the other metabolites more than 1 soil was tested. The notifer calculated these using first-order kinetics in Modelmaker based on formation of HMUD and its subsequent degradation (HMUD formation fraction used was 0.00752 and 0.00786 respectively).

Table 8.3-11: Summary of aerobic degradation rates for AUSN - laboratory studies

AUSN, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH (KCl)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Collombey	Loamy sand	7.6	20	40	73.8	245.1	60.0	0.894	1st order non-linear	Yes / EFSA, 2007
Speyer 2.2	Loamy sand	6.0	20	40	218.2	724.8	192.3	0.907	1st order non-linear	
Les Evouettes	Loam	7.3	20	40	101.4	336.9	65.2	0.856	1st order non-linear	
Worst case (n=3)							**192.3**			
pH-dependency:							No			

Table 8.3-12: Summary of aerobic degradation rates for ADMP - laboratory studies

ADMP, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH (KCl)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Collombey	Loamy sand	7.6	20	40	2.9	9.5	2.4	0.995	1st order non-linear	Yes / EFSA, 2007
Speyer 2.2	Loamy sand	6.0	20	40	6.1	20.4	5.4	0.980	1st order non-linear	
Les Evouettes	Loam	7.3	20	40	11.3	37.7	7.3	0.970	1st order non-linear	
Geometric mean (n=3)							**4.5**			
pH-dependency:							No			

Table 8.3-13: Summary of aerobic degradation rates for UCSN - laboratory studies

UCSN, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH (KCl)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Collombey	Loamy sand	7.6	20	40	126.2	419.3	102.6	0.993	1st order non-linear	Yes / EFSA, 2007
Speyer 2.2	Loamy sand	6.0	20	40	307.5	1021.7	271.0	0.907	1st order non-linear	
Les Evouettes	Loam	7.3	20	40	229.3	761.7	147.5	0.942	1st order non-linear	
Worst case (n=3)							**271.0**			
pH-dependency:							No			

Table 8.3-14: Summary of aerobic degradation rates for ASDM - laboratory studies

ASDM, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH (KCl)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Collombey	Loamy sand	7.6	20	40	90.5	300.8	73.6	0.995	1st order non-linear	Yes / EFSA, 2007
Speyer 2.2	Loamy sand	6.0	20	40	268.5	892.1	236.6	0.933	1st order non-linear	
Les Evouettes	Loam	7.3	20	40	114.8	381.4	73.8	0.992	1st order non-linear	
Worst case (n=3)							**236.6**			
pH-dependency:							No			

Table 8.3-15: Summary of aerobic degradation rates for MU-466 - laboratory studies

MU-466, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH ($CaCl_2$)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Uffholtz	Silty clay loam	5.74	20	40	89.5	297	66.3	0.943	1st order non-linear	Yes / EFSA, 2007

MU-466, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH ($CaCl_2$)**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
Speyer 2.1	Sand	6.2	20	40	84	279	75.5	0.975	1st order non-linear	
3A	Loam	7.1	20	40	67.9	225.5	59.1	1.0	1st order non-linear	
Worst case (n=3)							**75.5**			
pH-dependency:							No			

zRMS Comments:	The submitted data for active substance and its metabolites were agreed at the EU level (EFSA, 2007). These values will be used in further exposure assessment.

8.3.1.3 Dicamba and its metabolites

Studies on the aerobic degradation rates of dicamba and its metabolite DCSA (NOA414746) are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of dicamba (Dicamba, EFSA Journal 2011;9(1):1965).

Table 8.3-16: Summary of aerobic degradation rates for dicamba - laboratory studies

Dicamba, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**Chi^2 (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
BBA 2.2	Loamy sand	5.5	20 ± 2	40	3.2	10.8	3.2	13.0	SFO	Yes / EFSA, 2011
Gartenacker	Loam	7.3	20 ± 2	40	3.3	11.0	3.3	13.1	SFO	
Pappelacker	Sandy loam	7.4	20 ± 2	40	4.2	13.9	4.1	10.1	SFO	
Borstel	Loamy sand	5.8	20 ± 2	40	5.5	18.4	4.6	9.7	SFO	
Elliot	Silt loam	5.1	23 ± 1	75% FC	3.9	12.8	4.9	16.2	SFO	
Geometric mean (n=5)							**4.0**			
pH-dependency:							No			

Table 8.3-17: Summary of aerobic degradation rates for DCSA (NOA414746) - laboratory studies

DCSA, Laboratory studies, aerobic conditions											
Soil name	**Soil type**	**pH**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction (-)**	**DT_{50} (d) 20°C pF2/10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level / Reference**
BBA 2.2	Loamy sand	5.5	20 ± 2	40	10.5	-	0.84	10.5	0.99	SFO - kinetic[a]	Yes / EFSA, 2011

[a] Kinetically derived considering continuous formation from the parent

Table 8.3-18: Summary of aerobic degradation rates for DCSA (NOA414746) - laboratory studies

DCSA, Laboratory studies, aerobic conditions											
Soil name	**Soil type**	**pH**	**t (°C)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**Formation fraction (-)**	**DT_{50} (d) 20°C pF2/10kPa**	**Chi^2 (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
BBA 2.2	Loamy sand	5.5	20 ± 2	40	12	39.8	-	12[a]	9.5	SFO[a]	Yes / EFSA, 2011
Gartenacker	Loam	7.3	20 ± 2	40	9.0	30.1	-	9.0[a]	21.4	SFO[a]	
Pappelacker	Sandy loam	7.4	20 ± 2	40	6.4	21.3	-	6.3[a]	7.6	SFO[a]	
Borstel	Loamy sand	5.8	20 ± 2	40	10.8	35.9	-	9.1[a]	.9	SFO[a]	
Elliot	Silt loam	5.1	23 ± 1	75% FC	9.7	32.3	-	12.1[a]	8.9	SFO[a]	
Geometric mean (n=5)							**-**	**9.4**			
pH-dependency:								No			

[a] Calculated from day of maximum formation (peak-down)

zRMS Comments:	The submitted data for active substance and its metabolites were agreed at the EU level (EFSA, 2011). These values will be used in further exposure assessment.

8.3.2 Anaerobic degradation in soil (KCP 9.1.1.1)

8.3.2.1 Prosulfuron and its metabolites

Studies on the anaerobic degradation rates of prosulfuron and its metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707, CGA325025 and SYN547308 (M18) are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of prosulfuron (Prosulfuron, EFSA Journal 2014;12(9): 3815).

For the currently intended product registration, application will take place only in spring or summer and anaerobic degradation is not considered a relevant breakdown process and therefore anaerobic degradation is not included as part of the risk assessment. Although it is not considered necessary to provide anaerobic degradation data, the following data on prosulfuron has been provided for information in the following.

Table 8.3-19: Summary of anaerobic degradation rates for prosulfuron - laboratory studies

Prosulfuron, Laboratory studies, anaerobic conditions										
Soil name	**Soil type (USDA)**	**pH (H_2O)**	**t (ºC)**	**MWHC (%)**	**DT_{50} (d)**	**DT_{90} (d)**	**DT_{50} (d) 20°C pF2/10kPa**	**Chi² (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
(Phenyl)	Sandy loam	6.6	25	75% FC	89	-	-	-	-	Yes / EFSA, 2020 ~~2014~~
(Triazine)	Sandy loam	6.6	25	75% FC	123	-	-	-	-	
(Triazine)	Sandy loam	6.1	25	75% FC	138	-	-	-	-	
Geometric mean/Median							-			
pH-dependency:							-			

8.3.2.2 Nicosulfuron and its metabolites

Studies on the anaerobic degradation rates of nicosulfuron and its metabolites HMUD, AUSN, ADMP, UCSN, ASDM and MU-466 are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007);120, 1-91).

For the currently intended product registration, application will take place only in spring or summer and anaerobic degradation is not considered a relevant breakdown process and therefore anaerobic degradation is not included as part of the risk assessment as it is not considered to be a relevant breakdown process.

8.3.2.3 Dicamba and its metabolites

Studies on the anaerobic degradation rates of dicamba and its metabolite DCSA (NOA414746) are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of dicamba (Dicamba, EFSA Journal 2011;9(1):1965).

For the currently intended product registration, application will take place only in spring or summer and anaerobic degradation is not considered a relevant breakdown process and therefore anaerobic degradation is not included as part of the risk assessment as it is not considered to be a relevant breakdown process.

8.4 Field studies (KCP 9.1.1.2)

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

8.4.1.1 Prosulfuron and its metabolites

Studies on the field dissipation rates of prosulfuron are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for the EU review of prosulfuron (Prosulfuron, EFSA Journal 2014;12(9): 3815; Prosulfuron, EFSA Journal 2020;18(7):6181).

The field dissipation data originally submitted during the EU review was excluded from the EU assessment as it did not comply with latest guidance (EFSA, 2014a)[3].

Additional data were not required as a result of the review, however to refine risk assessment endpoints in response to the challenged reliability of the field data presented in the EU review, further studies have been performed in accordance with EFSA (2014a). These data have been provided in A 2.2 and A 2.3 of this document.

[3] EFSA (2014a): EFSA Guidance Document for evaluating laboratory and field dissipation studies to obtain DegT50 values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal (2014);12(5):3662, 37pp

With the EFSA $DegT_{50}$ Endpoint Selector it was determined that the laboratory and field databases are statistically different (EFSA, 2014a). This conclusion justifies treating the datasets distinctively and using a tiered assessment distinguishing between laboratory and field dissipation values.

Triggering endpoints

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

Prosulfuron -Aerobic conditions – Triggering endpoints									
Soil type	**Location**	**pH**	**Depth (cm)**	**DissT50 (d) actual**	**DT90(d) actual**	**DT50 (d) Norm.**	**Chi^2 (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
Sandy loam Bare soil	Altratjensdorf, Germany	6.1	30	38.9	129	-	10.2	SFO	~~Yes / EFSA, 2014~~ Yes / EFSA, 2020
Silt loam Bare soil	Wallesdorf, Germany	6.8	30	4.3	30.2	-	5.2	DFOP[a]	
Loamy sand Bare soil	Coesfeld, Germany	4.9	20	16.1	53.4	-	15.8	SFO	
Silt loam Bare soil	Uhrsleben, Germany	6.2	20	18.5	61.4	-	16.9	SFO	
Sandy loam Bare soil	Altratjensdorf, Germany	6.2	20	7.8	25.9	-	13.6	SFO	
Sandy loam Bare soil	Herxheimweyher, Germany	6.8	20	10.0	33.1	-	4.4	SFO	
Silt loam Maize	Vouvry, Switzerland	7.8	30	4.6	30.9	-	1.1	FOMC[b]	
Loamy sand Maize	Vouvry, Switzerland	7.8	30	4.6	15.2	-	5.7	SFO	
Sandy loam Maize	Camisano, Vicentino, Italy	7.4	30	3.8	54.5	-	1.1	DFOP[c]	
Silt loam Maize	Estillac, France	7.0	30	15.6	51.9	-	14.5	SFO	
Silt loam Bare soil	Estillac, France	7.0	30	6.1	20.4	-	14.9	SFO	
Sandy loam Bare soil	Bogense, Denmark	6.48	20	4.6	55.8	-	8.23	DFOP[d]	
Silt loam Bare soil	Castelsarrasin, France	6.06	10	11.4	38.0	-	12.4	SFO	
Loam Bare soil	St. Cyprien, France	7.4	20	17.4	150	-	5.5	DFOP[e]	
Clay	Breitenwisch ,	5.32	10	9.01	29.9	-	12.6	SFO	

Prosulfuron -Aerobic conditions – Triggering endpoints									
Soil type	**Location**	**pH**	**Depth (cm)**	**DissT50 (d) actual**	**DT90(d) actual**	**DT50 (d) Norm.**	**Chi^2 (%)**	**Kinetic model**	**Evaluated on EU level / Reference**
loam Bare soil	Germany								
Clay Bare soil	Canals, Spain	7.6	20	17.4[a]	93.2[a]	-	5.99	DFOP[f]	
Loam Bare soil	Wilson, UK	7.07	10	12.5	41.6	-	17.8	SFO	
Maximum (n=~~11~~ 17)				38.9[~~d~~ g]					

[a] k_1=0.1952, k_2=0.0080, g=0.8758
[b] α=1.3659, β=7.0222
[c] k_1=0.3106, k_2=0.0207, g=0.6918
[d] k1=2.989, k_2=0.03143, g=0.4222
[e] k1=0.1201, k2=0.01126, g=0.4615
[f] k1=0.4408, k2=0.02076, g=0.2342
[~~d~~ g] Endpoint was used in PEC_S calculation

~~**Table 8.4-2: Summary of aerobic degradation rates for prosulfuron – field studies: Triggering endpoints**~~

~~Prosulfuron, Field studies – Triggering endpoints~~									
~~**Soil type (USDA)**~~	~~**Location**~~	~~**pH ($CaCl_2$)**~~	~~**Depth (cm)**~~	~~**$DegT_{50}$ (d) Actual**~~	~~**DT90 (d) Actual**~~	~~**Kinetic parameters**~~	~~**Chi^2 (%)**~~	~~**Kinetic model**~~	~~**Evaluated on EU level / Reference**~~
~~Sandy loam~~	~~Bogense (DK)~~	~~5.07~~	~~0-10~~	~~4.6~~	~~55.8~~	~~k_1: 2.989 k_2: 0.03143 g: 0.4222~~	~~8.23~~	~~DFOP~~	~~No / Hardy & Jastrzebski, 2015~~
~~Silt loam~~	~~Castelsarrasin (FR1)~~	~~4.94~~	~~0-10~~	~~11.4~~	~~38.0~~	~~-~~	~~12.4~~	~~SFO~~	
~~Loam~~	~~St. Cyprien (FR2)~~	~~6.71~~	~~0-10~~	~~17.4~~	~~150~~	~~k_1: 0.1201 k_2: 0.01126 g: 0.4615~~	~~5.5~~	~~DFOP~~	
~~Clay loam~~	~~Breitenwisch (DE)~~	~~4.89~~	~~0-10~~	~~9.01~~	~~29.9~~	~~-~~	~~12.6~~	~~SFO~~	
~~Clay~~	~~Canals (ES)~~	~~7.75~~	~~0-10~~	~~17.4[a]~~	~~93.2[a]~~	~~k1: 0.3333 k2: 0.02123 g: 0.2775~~	~~5.99~~	~~DFOP~~	
~~Loam~~	~~Wilson (UK)~~	~~7.16~~	~~0-10~~	~~12.5~~	~~41.6~~	~~-~~	~~17.8~~	~~SFO~~	
~~Maximum (n=6)~~									

~~[a] The values were taken from the original issued report by Hardy & Jastrzebski, 2015. In the meantime the report was re-issued with a corrected data. In the original data for the Spanish trial, erroneous core diameters were given.~~

Modelling endpoints

Table 8.4-32: Summary of aerobic degradation rates for prosulfuron - field studies: Modelling endpoints

Prosulfuron, Field studies – Modelling endpoints							
Soil type (USDA)	**Location**	**pH ($CaCl_2$)**	**Depth (cm)**	**$DegT_{50}$ (d) 20°C, pF2**	~~**$DegT_{90}$ (d) 20°C, pF2**~~	**Kinetic model**	**Evaluated on EU level / Reference**
Sandy loam	Bogense (DK)	~~5.07~~	0-10	~~23.3[a]~~ 18.6	~~77.4[b]~~	~~DFOP k_2~~ DFOP DT_{90}/3.32	~~No / Hardy & Jastrzebski, 2015a~~ Yes / EFSA, 2020
Silt loam	Castelsarrasin (FR1)	~~4.94~~	0-10	~~13.9~~ 15.5	~~46.3~~	SFO	
Loam	St. Cyprien (FR2)	~~6.71~~	0-10	~~43.2~~ 27.8	~~144~~	SFO	
Clay loam	Breitenwisch (DE)	~~4.89~~	0-10	~~10.1~~ 9.96	~~33.5~~	SFO	
Clay	Canals (ES)[c]	~~7.75~~	0-10	~~47.5~~ 43.5	~~158~~	SFO	
Loam	Wilson (UK)	~~7.16~~	0-10	~~11.9~~ 12.2	~~29.4~~	SFO	
Geometric mean (n=6)				~~20.8[d]~~ 18.7			
pH-dependency				No			

~~[a] k_2 $DegT_{50}$~~
~~[b] k_2 $DegT_{90}$~~
~~[c] In the original data for the Spanish trial, erroneous core diameters were given. Since then the values were recalculated and the report was reissued. The corrected data are: $DegT_{50}$ = 53.7 days ; $DegT_{90}$ = 178 days.~~
~~[d] The value of 20.8 days was taken from the original issued report by Hardy & Jastrzebski, 2015a. In the meantime the report was re-issued with a corrected geometric mean value of 21.2 days. In the original data for the Spanish trial, erroneous core diameters were given.~~

zRMS Comments:	The incorrect pH values were presented in Table 8.4-32. The DT_{50} values are correct.

8.4.1.2 Nicosulfuron and its metabolites

Studies on the field dissipation rates of nicosulfuron are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for the EU review of nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007);120, 1-91).

Triggering endpoints

Table 8.4-43: Summary of aerobic degradation rates for nicosulfuron - field studies: Triggering endpoints

Nicosulfuron, Field studies – Triggering endpoints									
Soil type	**Location**	**pH (KCl)**	**Depth (cm)**	**$DissT_{50}$ (d) Actual**	**$DissDT_{90}$ (d) Actual**	**Kinetic parameters**	**r^2**	**Method of calculation**	**Evaluated on EU level / Reference**
Sand	Flackenhorst,	5.7	0-10	20.7	68.8		0.869	1st order	Yes /

Nicosulfuron, Field studies – Triggering endpoints									
Soil type	**Location**	**pH (KCl)**	**Depth (cm)**	**DissT$_{50}$ (d) Actual**	**DissDT$_{90}$ (d) Actual**	**Kinetic parameters**	**r^2**	**Method of calculation**	**Evaluated on EU level / Reference**
	Germany							non linear	EFSA, 2007
Silty clay loam	Hünfelden, Germany	7.1	0-10	63.3	210		0.919	1st order non linear	Yes / EFSA, 2007
Loam	St. Claire, France (N)	5.3	0-5	12	40		0.946	1st order non linear	Yes / EFSA, 2007
Clay loam	Lanta, France (S)	6.0	0-5	8.9	29.7		0.964	1st order non linear	Yes / EFSA, 2007
Maximum (n=4)				63.3	210				
Geometric mean (n=4)				19.3	-				
pH-dependency				No					

Modelling endpoints

The field dissipation studies were not normalised according to FOCUS requirements; modelling endpoints are not available.

8.4.1.3 Dicamba and its metabolites

Triggering endpoints

On the basis of the short DT_{50} values of less than 60 days for both dicamba and DCSA (NOA414746), field dissipation studies are not required. However, available studies (Table 8.4-54) were provided for completeness.

Table 8.4-54: Summary of aerobic degradation rates for dicamba - field studies: Triggering endpoints

Dicamba, Field studies – Triggering endpoints								
Soil type	**Location**	**pH**	**Depth (cm)**	**DT_{50} (d)**	**DT_{50} (d)**	**r^2**	**Method of calculation**	**Evaluated on EU level / Reference**
Loamy sand	Switzerland	7.6	0-30	9	30	0.98	Least squares fitting procedure	Yes / DAR, 2007
Clay loam	Germany	6.9	0-40	2.9	10	0.995	Timme and Frehse	Yes / DAR, 2007
Silt loam	Germany	4.8	0-20	11	37	0.974	Timme and Frehse	Yes / DAR, 2007
Silt loam	Germany	6.7	0-10	1.8	6	0.971	Timme and Frehse	Yes / DAR, 2007
Sandy loam	Germany	5.9	0-60	1.8	6	0.948	Timme and Frehse	Yes / DAR, 2007
Geometric mean (n=5)				3.9	-			

Modelling endpoints

The field dissipation studies were not normalised according to FOCUS requirements; modelling endpoints are not available.

8.4.2 Soil accumulation testing (KCP 9.1.1.2.2)

Based on the field dissipation data, prosulfuron, nicosulfuron or dicamba are not likely to significantly accumulate in soil with repeated applications. The potential for accumulation has been assessed by calculation under Section 8.7.

8.5 Mobility in soil (KCP 9.1.2)

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

8.5.1 Prosulfuron and its metabolites

Studies on the mobility of prosulfuron and its metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707 and CGA325025 in soil are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of prosulfuron (Prosulfuron, EFSA Journal 2014;12(9): 3815; Prosulfuron, EFSA Journal 2020;18(7):6181).

An additional metabolite SYN547308 (M18) was identified during the risk assessment of prosulfuron. The new metabolite was acknowledged in the EFSA conclusion (2014, 2020). However, no adsorption data of this metabolite were available. The new metabolite SYN547308 was considered based on the new adsorption study by Crabtree, 2014[2]. These data have been provided in Appendix 2 of this document (A 2.4).

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

Prosulfuron							
Soil name	**Soil Type (USDA)**	**OC (%)**	**pH[a] ($CaCl_2$ or H_2O)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level/ Reference**
Fayette, USA	Loamy sand	0.46	7.7	0.07	15.2	0.82	Yes / EFSA, 2020 ~~2014~~
	Sandy loam	1.97	7.8	0.27	13.7	0.85	
	Silt loam	1.74	6.5	0.29	16.7	0.86	
	Silty clay loam	0.67	6.9	0.25	37.3	0.86	
Collombey	Loamy sand	0.76	7.0	0.03	3.9	0.92	
Lufa 2.1	Sand	0.36	6.6	0.09	25.0[b]	1.21[b]	
Les Evouettes	Silt loam	2.10	7.3	0.24	11.4	0.81	
Vetroz	Silt loam	4.39	7.1	0.36	8.2	0.89	
Illaraz	Humic silt loam	19.34	6.6	1.45	7.50	0.94	
Arithmetic mean (n=8)					14.2	0.869	
Geometric mean (n=8)					11.7	-	
pH-dependency					No		

[a] No information on which media pH was measured
[b] K_{foc} and 1/n values excluded from the calculation of the mean value since 1/n was significantly outside the range of expected values i.e. below 0.6 or above 1.1

Table 8.5-2: Summary of soil adsorption/desorption for CGA150829

CGA150829							
Soil Name	**Soil Type (USDA)**	**OC (%)**	**pH ($CaCl_2$)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Fayette	Sand	0.35	7.9[a]	0.23	66.7	0.8702	Yes / EFSA, 2020 ~~2014~~
	Sandy loam	0.99	7.8[a]	0.57	58.2	0.9024	
	Silt loam	1.74	6.5[a]	0.96	55.1	0.8474	
	Silty clay loam	0.70	6.9[a]	1.20	172	0.8230	
Laacher Hof Wurmwiese	Loam	1.8	5.3	1.321	73.4	0.9183	
Hoefchen Am Hohenseh	Silt loam	2.4	6.6	0.481	20.0	0.9755	
Les Cayades	Clay loam	0.9	7.6	0.561	62.3	0.9170	
Guadalupe	Sandy loam	0.7	6.7	0.675	96.5	0.9498	
Springfield	Silt loam	1.7	6.6	3.147	185.1	0.9021	
Myaka	Sandy soil	0.58	6.2 [a]	0.264	45.5	0.873	
Sassafras	Sandy loam	0.46	6.3[a]	0.621	133.8	0.784	
Matapeake	Silt loam	1.1	5.3[a]	2.36	214.2	0.841	
Drummer	Silty clay loam	3.0	5.7[a]	6.80	225.5	0.841	
Gross-	Silt loam	1.2	7.7[a]	0.225	18.8	1.05	

CGA150829							
Soil Name	**Soil Type (USDA)**	**OC (%)**	**pH ($CaCl_2$)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Umstadt							
Arrow	Sandy loam	2.3	5.7[a]	0.682	29.7	0.94	
Mattapex	Silt loam	2.6	6.4[a]	0.433	16.7	0.96	
Hoville	Loamy silt	0.91	6.7[a]	1.57	172	0.835	
SL S	Silt loam	2.08	7.0[a]	0.44	21.3	0.873	
LS 2.2	Loamy sand	1.95	6.0[a]	0.30	15.4	0.909	
SL V	Sandy loam	0.43	6.0[a]	0.32	74.4	0.840	
Speyer 2.1	n/a	0.56	6.0[a]	0.2025	36	0.92	~~Yes / EFSA, 2014~~ Yes / EFSA, 2020[b]
Standard soil No115	n/a	1.7	7.4[a]	0.6255	37	0.89	
Standard soil No164	n/a	3.0	6.5[a]	0.645	22	0.92	
Standard soil No243	n/a	1.1	4.3[a]	0.337	31	0.91	
Germany	Sand	1.97	5.4[a]	0.37	18.92	0.640	
Germany	Loam	2.42	7.3[a]	0.43	17.97	0.759	
Germany	Clay	1.84	6.9[a]	0.43~~[b]~~	2.95~~[b]~~	1.422~~[b]~~	
Arithmetic mean (n=26)					~~87.8~~ 71.2/45.5[c]	~~0.858~~ 0.90/nr	
Geometric mean (n=26)					~~50.7~~ 45.6	-	
pH-dependency					No		

[a] No information on which media pH was measured
~~[b] K_{foc} and 1/n values excluded from the calculation of the geomean value since 1/n was significantly outside the range of expected values i.e. below 0.6 or above 1.1. Additionally K_f anf K_{foc} values do not match~~
[b] Van Noorlos & Slagen (2001) and Morlock (2006) studies were accepted in the RAR for the active substance thifensulfuron-methyl. Endpoints were not used in the available exposure assessment by EFSA (see EFSA, 2020).
[c] $CaCl_2$

Table 8.5-3: Summary of soil adsorption/desorption for CGA159902

CGA159902							
Soil Name	**Soil Type (USDA)**	**OC (%)**	**pH[a] ($CaCl_2$ or H_2O)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Fayette, USA	Loamy sand	0.46	7.7	0.40	87.0	0.93	Yes / EFSA, 2020 ~~2014~~
	Sandy loam	1.97	7.8	1.24	62.9	0.83	
	Silt loam	1.74	6.5	0.77	44.3	0.81	
	Silty clay loam	0.67	6.9	0.59	88.1	0.94	
Arithmetic mean (n=4)					70.6	0.88	
Geometric mean (n=4)					68.0	-	
pH-dependency					No		

[a] No information on which media pH was measured

Table 8.5-4: Summary of soil adsorption/desorption for CGA300406

CGA300406							
Soil Name	**Soil Type (USDA)**	**OC (%)**	**pH[a] ($CaCl_2$ or H_2O)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Fayette, USA	Loamy sand	0.42	6.5	0.53	126[b]	1.24[b]	Yes / EFSA, 2020 ~~2014~~
	Sandy loam	1.0	6.8	0.49	49.0	0.87	
	Loam	1.11	6.7	0.47	42.3	0.89	
	Silty clay loam	2.59	6.4	1.28	49.4	0.93	
Arithmetic mean (n=3)					46.9	0.90	
Geometric mean (n=3)					46.8	-	
pH-dependency					No		

[a] No information on which media pH was measured
[b] The 1/n value of 1.24 was originally excluded from the dataset as considered outside the range of the expected value. However, in this case, it is considered that this omission adversely affects the results of the exposure assessment.

Table 8.5-5: Summary of soil adsorption/desorption for CGA325025

CGA325025							
Soil Name	**Soil Type (USDA)**	**OC (%)**	**pH[a] ($CaCl_2$ or H_2O)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Fayette County, Kentucky	Sandy loam	1.0	6.8	0.242	24.2	1.042	Yes / EFSA, 2020 ~~2014~~
	Sand	0.42	6.5	0.135	32.2	0.853	
	Loam	1.15	6.7	0.336	29.2	0.939	
	Clay	1.67	6.8	0.346	20.7	1.057	
Arithmetic mean (n=4)					26.6	0.973	
Geometric mean (n=4)					26.2	-	
pH-dependency					No		

[a] No information on which media pH was measured

Table 8.5-6: Summary of soil adsorption/desorption for SYN542604

SYN542604							
Soil Name	**Soil Type (USDA)**	**OC (%)**	**pH ($CaCl_2$)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
18 Acres	Sandy clay loam	2.21	5.84	3.01	136	0.88	Yes / EFSA, 2020 ~~2014~~
Vetroz	Loam	1.97	7.77	1.14	58	0.82	
Krone	Silt loam	1.14	5.38	0.98	86	0.88	
Nebraska	Silt loam	1.72	6.61	3.84	223	0.80	
Madera	Sandy loam	0.51	7.20	0.57	112	0.86	
				Arithmetic mean (n=5)	123	0.85	
				Geometric mean (n=5)	111.1	-	
				pH-dependency	No		

Table 8.5-7: Summary of soil adsorption/desorption for CGA349707

CGA349707							
Soil Name	**Soil Type (USDA)**	**OC (%)**	**pH (H_2O)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Collombey	Loamy sand	2.0	7.6	1.03	51.7	0.96	Yes / EFSA, 2020 ~~2014~~
Les Evouttes	Silt loam	2.4	7.2	0.88	36.7	0.85	
Vetroz	Silt loam	4.7	7.2	2.11	44.9	1.08	
				Arithmetic mean (n=3)	44.4	0.96	
				Geometric mean (n=3)	44.0	-	
				pH-dependency	No		

Table 8.5-8: Summary of soil adsorption/desorption for SYN547308 (refer to A 2.4: Crabtree, 2014)

SYN547308							
Soil Name	**Soil Type (USDA)**	**OC (%)**	**pH ($CaCl_2$)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Vetroz	Loam	2.3	7.7	1.49	65	0.9318	~~No / Crabtree, 2014~~ Yes / EFSA, 2020
18 Acres	Sandy clay loam	3.0	5.8	2.89	96	0.9527	
Krone	Silt loam	1.3	5	3.74	288[a]	0.9501[a]	
Madera	Sandy loam	0.5	7.3	0.42	83	0.9193	
Sarpy	Silt loam	1.8	6.4	2.23	124	0.9127	
				Arithmetic mean[b] (n=5)	~~131.2~~ -	~~0.933~~ 0.929	
				Geometric mean[b] (n=5)	~~113.1~~ 89.5	-	
				pH-dependency	~~No~~		

SYN547308							
Soil Name	**Soil Type (USDA)**	**OC (%)**	**pH ($CaCl_2$)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
					Yes (conservative geometric mean was derived since pH dependence could not be excluded)		

[a] This soil was excluded from arithmetic/ geometric mean due to potential pH dependence.
[b] For soils with pH ≥6.5

8.5.2 Nicosulfuron and its metabolites

Studies on the mobility of nicosulfuron and its metabolites in soil HMUD, AUSN, ADMP, UCSN, ASDM and MU-466 are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007);120, 1-91).

Additional data were not required as a result of the review, however, to refine risk assessment endpoints in response to comments in the Addendum to the DAR May 2007 regarding the K_{Fclay} approach and the fact that it does not allow for any contribution by organic carbon (i.e. if a soil had no clay there would be no adsorption). In addition, Syngenta have been given access to Cheminova study (Graham & Strachan, 2008) in which additional soil adsorption values are available for nicosufuron. On the basis of these data together with the previous 4 data points in the DAR, an organic carbon driven sorption approach (K_{FOC}) was considered as an appropriate option.

Table 8.5-9: Summary of soil adsorption/desorption for nicosulfuron

Nicosulfuron (pyrimidine label)								
Soil name	**Soil type (USDA)**	**OC (%)**	**Clay (%)**	**pH**	**K_F (mL/g)**	**K_{FOC} (mL/g)**	**1/n (-)**	**Evaluated on EU level/ Reference**
Speyer 2.1	Loamy sand	0.48	7.2	6.0	0.05	10.0	0.90	Yes / EFSA, 2007
Speyer 2.2	Loamy sand	2.55	8.8	6.0	0.20	7.9	0.92	
Itingen II	Silt loam	1.42	23.4	7.7	0.73	51.3	0.94	
Les Evouettes	Loam	1.40	11.3	6.1	0.19	13.7	1.01	
~~PT103~~	~~Sandy loam~~	~~1.4~~	~~13~~	~~4.4~~	~~0.90~~	~~64~~	~~1.0019~~	~~No / Graham. & Strachan, 2008~~
~~SK961089~~	~~Clay loam~~	~~4.8~~	~~28~~	~~7.5~~	~~0.78~~	~~16~~	~~0.9325~~	
~~SK920191~~	~~Clay loam~~	~~4.8~~	~~36~~	~~7.3~~	~~1.04~~	~~22~~	~~0.9503~~	
~~SK104691~~	~~Silt loam~~	~~2.5~~	~~18~~	~~6.1~~	~~0.35~~	~~14~~	~~0.9158~~	
~~Matanuska~~	~~Silt loam~~	~~3.2~~	~~9~~	~~4.7~~	~~0.42~~	~~13~~	~~0.9493~~	
~~SK566696~~	~~Loamy sand~~	~~0.8~~	~~9~~	~~4.2~~	~~0.52~~	~~65~~	~~0.9545~~	
~~SK179618~~	~~Loam/Silt loam~~	~~3.9~~	~~18~~	~~5.0~~	~~0.46~~	~~12~~	~~0.9514~~	
~~Speyer 2.1~~	~~Sand~~	~~0.4~~	~~5~~	~~5.1~~	~~0.11~~	~~27~~	~~0.9773~~	
~~TL 78517229~~	~~Loamy~~	~~0.7~~	~~8~~	~~7.6~~	~~0.15~~	~~21~~	~~0.9554~~	

Nicosulfuron (pyrimidine label)								
Soil name	**Soil type (USDA)**	**OC (%)**	**Clay (%)**	**pH**	**K_F (mL/g)**	**K_{FOC} (mL/g)**	**1/n (-)**	**Evaluated on EU level/ Reference**
	~~sand~~							
~~MCL~~	~~Silt loam~~	~~2.4~~	~~26~~	~~5.6~~	~~6.99~~	~~291~~	~~0.9705~~	
~~Arithmetic mean (n=14)~~					~~-~~	~~45~~	~~0.952~~	
~~Geometric mean (n=14)~~					~~-~~	~~24.6~~	~~-~~	
~~pH-dependency~~				~~No (refer to Graham & Strachan, 2008)~~				
~~Clay- dependency~~				~~No (refer to Graham & Strachan, 2008)~~				

zRMS Comments:	The new study Graham. & Strachan, 2008 was not evaluated. For exposure assessment the agreed endpoints should be used. The active substance is during renewal process and the new study should be evaluated by RMS. In accordance with EFSA, 2007 the nicosulfuron is pH dependent and it should be considered in further PECgw and PECsw assessment.

Table 8.5-10: Summary of soil adsorption/desorption for HMUD

HMUD (non-radiolabelled)							
Soil Name	**Soil type (USDA)**	**OC (%)**	**pH ($CaCl_2$)**	**K_d (mL/g)**	**K_{OC} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Speyer 2.2	Sandy loam	2.3	5.6	0.12	5.07	-	Yes / EFSA, 2007
Mechtildshausen	Loam	1.28	7.37	0.14	10.75	-	
Uffholtz	Silt clay loam	2.67	5.42	0.02	0.88	-	
Sawtry	Clay	2.94	7.23	0.19	6.98	-	
Bretagne 1	Silt loam	2.11	5.7	0.08	2.83	-	
Arithmetic mean (n=5)				-	5.3	-	
Geometric mean (n=5)				-	3.9	-	
pH-dependency			No				

Table 8.5-11: Summary of soil adsorption/desorption for AUSN

AUSN (pyridine label)							
Soil Name	**Soil type (USDA)**	**OC (%)**	**pH (H_2O)**	**K_F (mL/g)**	**K_{FOC} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Speyer 2.2	Loamy sand	2.29	7.0	0.30	13.0	0.98	Yes / EFSA, 2007

AUSN (pyridine label)							
Soil Name	**Soil type (USDA)**	**OC (%)**	**pH (H_2O)**	**K_F (mL/g)**	**K_{FOC} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Collombey	Loamy sand	1.17	7.7	0.42	35.6	0.92	
Sisseln	Sandy loam	1.557	7.8	0.61	39.0	0.98	
Vetroz	Silt loam	4.05	7.3	0.90	22.3	0.96	
Arithmetic mean (n=4)					27.5	0.96	
pH-dependency			PEC_{GW} calculated with scenario specific K_{OC} and 1/n				

Table 8.5-12: Summary of soil adsorption/desorption for ADMP

ADMP (pyrimidine label)							
Soil Name	**Soil type (USDA)**	**OC (%)**	**pH (H_2O)**	**K_F (mL/g)**	**K_{FOC} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Speyer 2.2	Loamy sand	2.29	7.0	1.17	50.9	0.84	Yes / EFSA, 2007
Collombey	Loamy sand	1.17	7.7	0.71	60.4	0.82	
Sisseln	Sandy loam	1.557	7.8	0.83	52.8	0.92	
Vetroz	Silt loam	4.05	7.3	1.70	42.0	0.91	
Arithmetic mean (n=4)				1.10	51.5	0.87	
Geometric mean (n=4)				-	51.1	-	
pH-dependency			No				

Table 8.5-13: Summary of soil adsorption/desorption for UCSN

UCSN (pyridine label)							
Soil Name	**Soil type (USDA)**	**OC (%)**	**pH (H_2O)**	**K_d (mL/g)**	**K_{OC} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Speyer 2.2	Loamy sand	2.29	7.0	0.02	1.1	-	Yes/ EFSA, 2007
Collombey	Loamy sand	1.17	7.7	0.07	5.6	-	
Sisseln	Sandy loam	1.557	7.8	0.06	3.5	-	
Vetroz	Silt loam	4.05	7.3	0.09	2.1	-	
Arithmetic mean (n=4)				-	3.1	-	
Geometric mean (n=4)				-	2.6	-	

UCSN (pyridine label)							
Soil Name	**Soil type (USDA)**	**OC (%)**	**pH (H_2O)**	**K_d (mL/g)**	**K_{OC} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
pH-dependency			No				

Table 8.5-14: Summary of soil adsorption/desorption for ASDM

ASDM (pyridine label)							
Soil Name	**Soil type (USDA)**	**OC (%)**	**pH (H_2O)**	**K_d (mL/g)**	**K_{OC} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Speyer 2.2	Loamy Sand	2.29	7.0	0.05	2.3	0.82	Yes / EFSA, 2007
Collombey	Loamy Sand	1.17	7.7	0.08	6.7	0.81	
Sisseln	Sandy Loam	1.557	7.8	0.12	7.7	1.07	
Vetroz	Silt Loam	4.05	7.3	0.24	6.0	0.94	
Arithmetic mean (n=4)				0.12	5.7	0.91	
Geometric mean (n=4)				-	-	-	
pH-dependency			PEC_{GW} calculated with scenario specific K_{FOC} and 1/n				

Table 8.5-15: Summary of soil adsorption/desorption for MU-466

MU-466 (non-radiolabelled)							
Soil Name	**Soil type (USDA)**	**OC (%)**	**pH (CaCl2)**	**K_d (mL/g)**	**K_{OC} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Speyer 2.2	Sandy loam	2.3	5.6	0.07	3.05	-	Yes / EFSA, 2007
Mechtildshausen	Loam	1.28	7.37	0.14	10.73	-	
Uffholtz	Silt clay loam	2.67	5.42	0.04	1.32	-	
Sawtry	Clay	2.94	7.23	0.43	16.08	-	
Bretagne 1	Silt loam	2.11	5.7	0.17	6.50	-	
Arithmetic mean (n=4)				-	-	-	
Geometric mean (n=4)				-	-	-	
pH-dependency			PEC_{GW} calculated with scenario specific K_{OC} and 1/n				

8.5.3 Dicamba and its metabolites

Studies on the mobility of dicamba and its metabolite in soil DCSA are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for the EU review of dicamba (Dicamba, EFSA Journal 2011;9(1):1965).

Table 8.5-16: Summary of soil adsorption/desorption for dicamba

Dicamba							
Soil name	**Soil type**	**OC (%)**	**pH**	**K_F (mL/g)**	**K_{FOC} (mL/g)**	**1/n (-)**	**Evaluated on EU level/ Reference**
Kenyon	Loam	2.2	7.1	0.16	7.27	0.74	Yes / EFSA, 2011
Cook	Clay loam	2.9	6.9	0.10	3.45	0.62	
Champaign	Silt loam	2.5	5.1	0.53	21.2	0.80	
Winters	Sediment loam	1.2	7.3	0.21	17.5	0.80	
Arithmetic mean (n=4)				0.25	12.36	0.74	
Geometric mean (n=4)				-	9.82	-	
pH-dependency			No				

Table 8.5-17: Summary of soil adsorption/desorption for DCSA (NOA414746)

DCSA							
Soil Name	**Soil type**	**OC (%)**	**pH**	**K_F (mL/g)**	**K_{FOC} (mL/g)**	**1/n (-)**	**Evaluated on EU level / Reference**
Kenyon	Loam	2.2	7.1	31.5	1432	0.72	Yes / EFSA, 2011
Cook	Clay loam	2.9	6.9	7.0	242	0.80	
Champaign	Silt loam	2.5	5.1	20.3	812	0.93	
Huron	Sandy loam	0.4	8.1	2.5	628	0.79	
Winters	Sediment loam	1.2	7.3	35.2	2930	0.77	
Arithmetic mean (n=5)				19.3	1209	0.80	
Geometric mean (n=5)				-	877	-	
pH-dependency			No				

8.5.4 Column leaching (KCP 9.1.2.1)

Column leaching studies on prosulfuron, dicamba and nicosulfuron are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for the EU review of prosulfuron (Prosulfuron, EFSA Journal 2014;12(9): 3815; Prosulfuron, EFSA Journal 2020;18(7):6181), nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007);120, 1-91) and dicamba (Dicamba, EFSA Journal 2011;9(1):1965).

8.5.5 Lysimeter studies (KCP 9.1.2.2)

Lysimeter studies on prosulfuron, nicosulfuron and dicamba are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007);120, 1-91) and dicamba (Dicamba, EFSA Journal 2011;9(1):1965).

8.5.6 Field leaching studies (KCP 9.1.2.3)

Field leaching studies were not considered necessary for prosulfuron, nicosulfuron and dicamba and none were submitted during the respective EU reviews of prosulfuron (Prosulfuron, EFSA Journal 2014; 12(9):3815; Prosulfuron, EFSA Journal 2020;18(7):6181), nicosulfuron (Nicosulfuron, EFSA Scientific

Report (2007);120, 1-91) and dicamba (Dicamba, EFSA Journal 2011;9(1):1965).

8.6 Degradation in the water/sediment systems (KCP 9.2, KCP 9.2.1, KCP 9.2.2, KCP 9.2.3)

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

8.6.1 Prosulfuron and its metabolites

Studies on degradation in water/sediment systems prosulfuron and its aquatic metabolites CGA159902, CGA300406, SYN542604 and CGA349707 are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of prosulfuron (Prosulfuron, EFSA Journal 2014;12(9):3815; Prosulfuron, EFSA Journal 2020;18(7):6181).

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

Prosulfuron Distribution (max. water 100% after 0 days; max. sediment 27.1% after 60 days at 20°C)										
Water/sediment system	**pH water/ sed. (KCl)**	**$DegT_{50}$ whole syst. (d)**	**$DegT_{90}$ whole syst. (d)**	**Kinetic model**	**$DissT_{50}$ water (d)**	**$DissT_{90}$ water (d)**	**Kinetic model**	**$DissT_{50}$ sed. (d)**	**Kinetic model**	**Evaluated on EU level / Reference**
Pond	-/6.3	170	566	-	89.5	297	-	-	SFO	Yes / EFSA, 2014 and EFSA Journal 2020
Rhine river	-/7.2	119	394	-	86.2	286	-	-	SFO	
Pond	-/7.2	205	682	-	115	859	-	-	SFO	
Rhine river	-/7.2	216	718	-	127	423	-	-	SFO	
Geometric mean (n=4)		173	-		103	-		-		-

Table 8.6-2: Summary of observed metabolites

Metabolite	Maximum observed value in water/sediment system	Evaluated on EU level / Reference
CGA159902 Water/sediment system	Max. in water 2.7% after 59 d Max. in sediment 20.5% after 365 d Max. in whole system 21.6%	Yes / EFSA, 2014 and EFSA Journal 2020
CGA300406 Water/sediment system	Max. in water 24.6% after 181 d Max. in sediment 15.97% after 270 d Max. in whole system 34.3%	
SYN542604 Water/sediment system	Max. in whole system 24.8%	
CGA349707 Water/sediment system	Max. in whole system 16.1%	

8.6.2 Nicosulfuron and its metabolites

Studies on the mobility of nicosulfuron and its aquatic metabolites HMUD, AUSN, ADMP, UCSN and ASDM are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007);120, 1-91).

Table 8.6-3: Summary of degradation in water/sediment of nicosulfuron

Nicosulfuron Distribution (max. water 96.4% after 0 days, max. sediment 24.0% after 14 days)										
Water/ sediment system	**pH water/ sed.**	**$DegT_{50}$ whole syst. (d)**	**$DegT_{90}$ whole syst. (d)**	**Kinetic model**	**$DissT_{50}$ water (d)**	**$DissT_{90}$ water (d)**	**Kinetic model**	**$DissT_{50}$ sed. (d)**	**Kinetic model**	**Evaluated on EU level / Reference**
River (Rhine)	6.9	49.8	165.4	1st order non-linear	32.0	106.2	1st order non-linear	21.9	-	Yes / DAR, 2006
Pond (Anwil)	6.9	33.2	110.2		24.9	82.9		8.8	-	
Geometric mean (n=2)		42.3[a]			65.0			13.9		Yes, EFSA / 2007

[a] Representative worst case from sediment water studies

Table 8.6-4: Summary of observed metabolites

Metabolite	Maximum observed value in water/sediment system	Evaluated on EU level / Reference
HMUD Water/sediment system	Max. in water 14.1% after 62 d (pond, pyridine) Max. in sediment 5.7 % after 30 d (pond, pyridine)	Yes DAR, 2006
AUSN Water/sediment system	Max. in water 9.1 % after 177 d (river, pyridine) Max. in sediment 2.4 % after 105 d (pond, pyridine)	
UCSN Water/sediment system	Max. in water 5.4 % after 177 d (river, pyridine) Max. in sediment 1.4 % after 105 d (river, pyridine)	Yes DAR, 2006
ASDM Water/sediment system	Max. in water 6.9 % after 177 d (river, pyridine) Max. in sediment 4.4 % after 62 d (pond, pyridine)	

8.6.3 Dicamba and its metabolites

Studies on the mobility of dicamba and its aquatic metabolite DCSA (NOA414746) are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of dicamba (Dicamba, EFSA Journal 2011;9(1):1965).

Table 8.6-5: Summary of degradation in water/sediment of dicamba

Dicamba Distribution (max. sediment Rhine 5.5 % after 7 days, max. sediment Pond 6 % after 7 days)										
Water/ sediment system	pH water/ sed.	$DegT_{50}$ whole syst. (d)	$DegT_{90}$ whole syst. (d)	Kinetic model	$DissT_{50}$ water (d)	$DissT_{90}$ water (d)	Kinetic model	$DissT_{50}$ sed. (d)	Kinetic model	Evaluated on EU level / Reference
Rhine	8.3 / 7.6	38*	125*	SFO	-	-	-	-	-	Yes / EFSA, 2011
Pond	8.3 / 7.4	45*	151*	SFO	-	-	-	-	-	
Geometric mean (n=2)		41*	137*		-	-		-		

* The values are considered as uncertain (see EFSA, 2011)

Table 8.6-6: Summary of observed metabolites

Metabolite	Maximum observed value in water/sediment system	Evaluated on EU level / Reference
DCSA Water/sediment system	Rhine: Max. in water 26.9 % after 60 d; Max. in sediment 4.5 % after 60 d ; Max. in whole system 31.4 % after 60 d Pond: Max. in water 12.5 % after 60 d; Max. in sediment 3.4 % after 60 d; Max. in whole system 15.9 % after 60 d	Yes, EFSA / 2011

8.7 Predicted Environmental Concentrations in soil (PEC_S) (KCP 9.1.3)

zRMS Comments:	Calculations of PEC_S for active substances, their metabolites and formulation used in maize were submitted.

In accordance with GAP table only one application per season was considered. Considering the worst case, the interception of 25% was taken into consideration.

Prosulfuron. The used endpoints for PECs assessment were agreed at the EU level. The following PECs values were calculated

Crop	**Maize**	**Maize**
Use No. in GAP table	1	2
Application rate g a.s/ha	16	20
Compound	PECs ini mg/kg soil	
Prosulfuron	0.016	0.020
CGA150829	0.002 0.004*	0.003 0.005*
CGA159902	0.005 0.009*	0.006 0.011*
CGA300406	0.004	0.005
SYN542604	0.004	0.006
CGA349707	0.003 0.005*	0.004 0.006*
CGA325025	0.003	0.003
SYN547308	0.002	0.002

* $PEC_{S,accum}$

Nicosulfuron. The used DT_{50} for active substance and its metabolites were in accordance with EFSA Conclusion, 2014.
The following PECs values were calculated

Crop	**Maize**	**Maize**
Use No. in GAP table	1	2
Application rate g a.s/ha	40	50
Compound	PECs ini mg/kg soil	
Nicsulfuron	0.040	0.050
HMUD	0.006	0.007
AUSN	0.008 0.009*	0.010 0.011*
ADMP	0.001	0.001
UCSN	0.003 0.004*	0.004 0.005*
ASDM	0.014 0.016*	0.018 0.021*

* $PEC_{S,accum}$

	Dicamba. The used DT_{50} for active substance and its metabolites were in accordance with EFSA Conclusion, 2011. The following PECs values were calculated

Crop	**Maize**	**Maize**
Use No. in GAP table	1	2
Application rate g a.s/ha	160	200
Compound	PECs ini mg/kg soil	
Dicamba	0.016	0.200
DCSA	0.112	0.140

Formulation. The PECs for formulation was assessed; PECs = 0.500 mg formulation/ha.

These values will be used in further risk assessment.

Unless otherwise stated, EU agreed endpoints refer to those stated in the EU review of prosulfuron (Prosulfuron, EFSA Journal 2014; 12(9): 3815; Prosulfuron, EFSA Journal 2020;18(7):6181), nicosulfuron (Nicosulfuron, EFSA Scientific Report 2007;120: 1-91) and dicamba (Dicamba, EFSA Journal 2011; 9(1):1965).

8.7.1 Justification for new endpoints

EU agreed endpoints were used for PEC_S calculations of prosulfuron, nicosulfuron, dicamba and their respective metabolites.

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

The PEC prosulfuron, dicamba, nicosulfuron and A18385B in soil (PEC_S) has been assessed with the FOCUS groundwater crop interception values, where appropriate, and the worst case DT_{50} values as proposed or established in the EU review.

Detailed summaries are provided in Appendix 3 below, but only for the active substance renewed, i.e. prosulfuron.

Table 8.7-1: Input parameters related to application for PEC_S calculations

Use No	1	2
Crop	Maize	Maize
Application rate (g as/ha)	Prosulfuron: 16 Nicosulfuron: 40 Dicamba: 160	Prosulfuron: 20 Nicosulfuron: 50 Dicamba: 200
Number of applications/interval (d)	1 / -	1 / -
Crop interception (%)	25	25
Depth of soil layer (relevant for plateau concentration) (cm)	20 (tillage)	20 (tillage)

Table 8.7-2: Input parameter for active substance(s) and relevant metabolite(s) for PEC_S calculation

Compound	Molar mass (g/mol)	Max. occurrence (%)	DT_{50} (d)	Value in accordance to EU endpoint / Reference
Prosulfuron	419.4	-	38.9 (maximum, non-normalised field studies)	Yes /, EFSA, 2020 ~~2014~~
CGA150829	140.1	40.6 (maximum in laboratory studies)	1000 (default)	Yes / EFSA, 2020 ~~2014~~
CGA159902	253.2	47.4 (maximum in laboratory studies)	1000 (default)	Yes / EFSA, 2020 ~~2014~~
CGA300406	405.4	24.0 (maximum in laboratory studies)	nr	Yes / EFSA, 2020 ~~2014~~
SYN542604	381.3	30.8 (maximum in laboratory studies)	184 (maximum, non-normalised, n=18)	Yes / EFSA, 2020 ~~2014~~
CGA349707	338.3	22.6 (maximum in laboratory studies	737 (maximum, non-normalised, n=7)	Yes / EFSA, 2020 ~~2014~~
CGA325025	404.4	17.4 (maximum in laboratory studies)	nr	Yes / EFSA, 2020 ~~2014~~
SYN547308	449.4	9.9	nr	Yes / EFSA, 2020 ~~2014~~
nr = not relevant				
Nicosulfuron	410.4	-	63 (SFO, maximum, field studies)	Yes / EFSA, 2007
HMUD	396.4	14.4 (in laboratory studies)	30.8 (SFO, maximum, laboratory studies, non-normalised)	Yes / EFSA, 2007
AUSN	314.3	26.8 (in laboratory studies)	218.2 (SFO, maximum, laboratory studies, non-normalised)	Yes / EFSA, 2007
ADMP	155.2	7.2 (in laboratory studies)	11.3 (SFO, maximum, laboratory studies, non-normalised)	Yes / EFSA, 2007
UCSN	315.3	11.0 (in laboratory studies)	307.5 (SFO, maximum, laboratory studies, non-normalised)	Yes / EFSA, 2007
ASDM	229.2	63.4 (in field studies)	268.5 (SFO, maximum, laboratory studies, non-normalised)	Yes / EFSA, 2007
Dicamba	221.0	-	5.5	Yes /

Compound	Molar mass (g/mol)	Max. occurrence (%)	DT_{50} (d)	Value in accordance to EU endpoint / Reference
			(SFO, maximum, laboratory studies, non-normalised)	EFSA, 2011
DCSA (NOA414746)	207.0	75[a] (conservative estimate)	12.0 (SFO, maximum, laboratory studies, non-normalised)	Yes / EFSA, 2011

[a] Conservative estimate of formation fraction significantly higher than the maximum observed in soil (EFSA, 2011)

8.7.2.1 Prosulfuron and its metabolites

Given the DT_{50} and DT_{90} of prosulfuron are < 100 d and 365 d respectively, as shown in Section 8.4.1.1, calculations to estimate potential accumulation of prosulfuron were not undertaken. The potential accumulation of prosulfuron metabolites (i.e. CGA150829, CGA159902, SYN542604, CGA349707 and SYN547308 in soil) was evaluated for these metabolites due to maximum DT_{50} > 100 days or DT_{90} > 1000 days. For details on $PEC_{S,accumulation}$ calculations refer to A 3.1.

Table 8.7-3: PEC_S for 1 × 16 g prosulfuron/ha on maize

PEC_S (mg/kg)		Maize			
		Single application		Multiple applications	
		Actual	TWA	Actual	TWA
Initial		0.016	-	-	-
Short term	24h	0.016	0.016	-	-
	2d	0.015	0.016	-	-
	4d	0.015	0.015	-	-
Long term	7d	0.014	0.015	-	-
	14d	0.012	0.014	-	-
	21d	0.011	0.013	-	-
	28d	0.010	0.013	-	-
	50d	0.007	0.011	-	-
	100d	0.003	0.007	-	-

Table 8.7-4: PEC$_S$ for 1 × 20 g prosulfuron/ha on maize

PEC$_S$ (mg/kg)		Maize			
		Single application		Multiple applications	
		Actual	TWA	Actual	TWA
Initial		0.020	-	-	-
Short term	24h	0.020	0.020	-	-
	2d	0.019	0.020	-	-
	4d	0.019	0.019	-	-
Long term	7d	0.018	0.019	-	-
	14d	0.016	0.018	-	-
	21d	0.014	0.017	-	-
	28d	0.012	0.016	-	-
	50d	0.008	0.013	-	-
	100d	0.003	0.009	-	-

PEC$_S$ of metabolites

Table 8.7-5: PEC$_S$ for CGA150829

Crop	PEC$_S$ (mg/kg)	Single application	Multiple applications
Maize (16 g a.s./ha)	$PEC_{S,ini}$	0.002	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 29	0.002	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.004	-
Maize (20 g a.s./ha)	$PEC_{S,ini}$	0.003	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 29	0.002	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.005	-

Table 8.7-6: PEC$_S$ for CGA159902

Crop	PEC$_S$ (mg/kg)	Single application	Multiple applications
Maize (16 g a.s./ha)	$PEC_{S,ini}$	0.005	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 30	0.004	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.009	-
Maize (20 g a.s./ha)	$PEC_{S,ini}$	0.006	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 29	0.005	-

Crop	PEC_S (mg/kg)	Single application	Multiple applications
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.011	-

Table 8.7-7: PEC_S for CGA300406

Crop	PEC_S (mg/kg)	Single application	Multiple applications
Maize (16 g a.s./ha)	$PEC_{S,ini}$	0.004	-
Maize (20 g a.s./ha)	$PEC_{S,ini}$	0.005	-

Table 8.7-8: PEC_S for SYN542604

Crop	PEC_S (mg/kg)	Single application	Multiple applications
Maize (16 g a.s./ha)	$PEC_{S,ini}$	0.004	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 4	< 0.001	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.004	-
Maize (20 g a.s./ha)	$PEC_{S,ini}$	0.006	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 4	< 0.001	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.006	-

Table 8.7-9: PEC_S for CGA349707

Crop	PEC_S (mg/kg)	Single application	Multiple applications
Maize (16 g a.s./ha)	$PEC_{S,ini}$	0.003	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 17	0.002	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.005	-
Maize (20 g a.s./ha)	$PEC_{S,ini}$	0.004	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 18	0.002	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.006	-

Table 8.7-10: PEC_S for CGA325025

Crop	PEC_S (mg/kg)	Single application	Multiple applications
Maize (16 g a.s./ha)	$PEC_{S,ini}$	0.003	-
Maize (20 g a.s./ha)	$PEC_{S,ini}$	0.003	-

Table 8.7-11: PEC_S for SYN547308

Crop	PEC_S (mg/kg)	Single application	Multiple applications
Maize (16 g a.s./ha)	$PEC_{S,ini}$	0.002	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 4	<0.001	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.002	-
Maize (20 g a.s./ha)	$PEC_{S,ini}$	0.002	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 7	<0.001	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.002	-

8.7.2.2 Nicosulfuron and its metabolites

Given the DT_{50} and DT_{90} of nicosulfuron are < 100 d and 365 d respectively, as shown in Section 8.3.1.2, calculations to estimate potential accumulation of nicosulfuron were not undertaken.

Given the fast degradation of nicosulfuron metabolites HMUD and ADMP (maximum DT_{50} = 30.8 d and 11.3 d, respectively), as shown in Section 8.3.1.2, calculations to estimate potential accumulation of these metabolites were not undertaken. Calculations of the potential accumulation of nicosulfuron metabolites AUSN, UCSN and ASDM in soil ($PEC_{S,accumulation}$) were conducted due to maximum DT_{50} > 100 days.

Table 8.7-12: PEC$_S$ for 1 × 40 g nicosulfuron/ha on maize

PEC$_S$ (mg/kg)		Maize			
		Single application		Multiple applications	
		Actual	TWA	Actual	TWA
Initial		0.040	-	-	-
Short term	24h	0.040	0.040	-	-
	2d	0.039	0.040	-	-
	4d	0.038	0.039	-	-
Long term	7d	0.037	0.038	-	-
	14d	0.034	0.037	-	-
	21d	0.032	0.036	-	-
	28d	0.029	0.034	-	-
	50d	0.023	0.031	-	-
	100d	0.013	0.024	-	-

Table 8.7-13: PEC$_S$ for 1 × 50 g nicosulfuron/ha on maize

PEC$_S$ (mg/kg)		Maize			
		Single application		Multiple applications	
		Actual	TWA	Actual	TWA
Initial		0.050	-	-	-
Short term	24h	0.049	0.050	-	-
	2d	0.049	0.049	-	-
	4d	0.048	0.049	-	-
Long term	7d	0.046	0.048	-	-
	14d	0.043	0.046	-	-
	21d	0.040	0.045	-	-
	28d	0.037	0.043	-	-
	50d	0.029	0.038	-	-
	100d	0.017	0.030	-	-

PEC$_S$ of metabolites

Table 8.7-14: PEC$_S$ for HMUD

Use	PEC$_S$ (mg/kg)	Single application	Multiple applications
Maize (40 g a.s./ha)	$PEC_{S,ini}$	0.006	-
Maize (50 g a.s./ha)	$PEC_{S,ini}$	0.007	-

Table 8.7-15: PEC_S for AUSN

Use	PEC_S (mg/kg)	Single application	Multiple applications
Maize (40 g a.s./ha)	$PEC_{S,ini}$	0.008	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 8	0.001	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.009	-
Maize (50 g a.s./ha)	$PEC_{S,ini}$	0.010	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 8	0.001	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.011	-

Table 8.7-16: PEC_S for ADMP

Use	PEC_S (mg/kg)	Single application	Multiple applications
Maize (40 g a.s./ha)	$PEC_{S,ini}$	0.001	-
Maize (50 g a.s./ha)	$PEC_{S,ini}$	0.001	-

Table 8.7-17: PEC_S for UCSN

Use	PEC_S (mg/kg)	Single application	Multiple applications
Maize (40 g a.s./ha)	$PEC_{S,ini}$	0.003	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 10	0.001	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.004	-
Maize (50 g a.s./ha)	$PEC_{S,ini}$	0.004	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 10	0.001	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.005	-

Table 8.7-18: PEC_S for ASDM

Use	PEC_S (mg/kg)	Single application	Multiple applications
Maize	$PEC_{S,ini}$	0.014	-

Use	PECs (mg/kg)	Single application	Multiple applications
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 10	0.002	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.016	-
Maize (50 g a.s./ha)	$PEC_{S,ini}$	0.018	-
	$PEC_{S,plateau}$ (20 cm) with tillage, after year 11	0.003	-
	$PEC_{S,accumulation}$ ($PEC_{S,ini}$ + $PEC_{S,plateau}$)	0.021	-

8.7.2.3 Dicamba and its metabolites

Only initial PEC_S values were calculated and used in the risk assessment. No accumulation of dicamba in the field can be expected given the rapid degradation observed in laboratory studies as shown in Section 8.3.1.3.

Table 8.7-19: PEC_S for 1 × 160 g dicamba /ha and 1 × 200 g dicamba on maize

Crop	PEC_S (mg/kg)	Single application	Multiple applications
Maize (160 g a.s./ha)	$PEC_{S,ini}$	0.160	-
Maize (200 g a.s./ha)	$PEC_{S,ini}$	0.200	-

PEC_S of metabolite

Table 8.7-20: PEC_S for DCSA (NOA414746)

Crop	PEC_S (mg/kg)	Single application	Multiple applications
Maize (160 g a.s./ha)	$PEC_{S,ini}$	0.112	-
Maize (200 g a.s./ha)	$PEC_{S,ini}$	0.140	-

8.7.2.4 PEC_S of A18385B

The initial PEC_S for a single application is calculated as follows:

$$PEC_S\ (mg/kg) = \frac{\text{Application rate (g/ha)} \times (1\text{-}F)}{100 \times \text{Soil depth (cm)} \times \text{Soil dry bulk density}(g/cm^3)}$$

Soil depth = 5 cm
Soil bulk density= 1.5 g/cm^3
F= fraction intercepted by crop

Table 8.7-21: Initial PEC_S for A18385B following single/ spray application to maize

Formulation	Crop	Interception (%)	Number of applications	Maximum use rate (g A18385B / ha)	PEC_S (mg/kg dw)
A18385B[a]	Maize	25	1	500	0.500

[a] Formulation components other than the active substances are assumed to dissipate rapidly in the environment, therefore only an initial concentrations is calculated.

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

zRMS Comments	The submitted PECgw assessment was accepted. Calculations of PECgw for active substances and their relevant metabolites were provided in Tier 1 with PUF = 0. The recommended FOCUS models were used: FOCUS PELMO, FOCUS PEARL and FOCUS MACRO.

	Considering the worst case, the interception of 25% was taken into account. **Prosulfuron** All used endpoints were agreed at the EU level and were accepted. A tiered approach was used: Tier 1 based on lab studies for soil degradation. At Tier 1 the DT_{50} in soil of 62.1 d and PUF = 0 were used. At Tier 2 the PUF = 0.15 was considered. This approach was also used in Prosulfuron_AIR_Volume 3_B8_ Revised_2019-02. At Tier 2a and 2b the DT_{50} in soil of 18.7 d was used. This value was accepted for modelling. Additionally the application every other year was considered (Tier 2b). For metabolite CGA300406 the DT_{50} in soil of 2.6 d (acidic soils) and 30.2 d (alkaline soils) were accepted. The geometric mean of Kfoc for active substance and its metabolites were used in PECgw assessment. Data gap was identified in case of metabolite M17. The justification was submitted and accepted. **The maximum PEC_{GW} values for active substances were below the trigger value of 0.1 µg/L if prosulfuron was applied every 2nd year**. **Nicosulfuron**. The used endpoints were agreed at he EU level and were accepted. In PECgw assessment the DT_{50} value of 16.4 d (geom mean from lab studies) was accepted. The geometric mean of Kfoc for active substance and its metabolites were used in PECgw assessment. Taking into consideration the Koc dependence on pH value, the lower values were used in modelling (EFSA, 2007). The application every third year was considered. The maximum PEC_{GW} values for active substances were below the trigger value of 0.1 µg/L. **The maximum PEC_{GW} values for active substances were below the trigger value of 0.1 µg/L if nicosulfuron was applied every 3rd year**. **Dicamba**. The used endpoints were agreed at he EU level and were accepted. The geometric mean of Kfoc for active substance and its metabolites were used in PECgw assessment. **The maximum PEC_{GW} values for active substances were below the trigger value of 0.1 µg/L if dicamba was applied every 3rd year**. The active substances metabolites relevance was performed in Section 10.

Unless otherwise stated, EU agreed endpoints refer to those stated in the EU review of prosulfuron (Prosulfuron, EFSA Journal 2014; 12(9): 3815; Prosulfuron, EFSA Journal 2020;18(7):6181), nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007) 120,1-91) and dicamba (Dicamba, EFSA Journal 2011; 9(1):1965).

8.8.1 Justification for new endpoints

Prosulfuron:

For prosulfuron EFSA (2014) gives arithmetic mean K_{FOC} / K_{FOM} values. However, according to recent guidance (FOCUS, 2014; EFSA 2014a) [4,5] geometric mean sorption parameter were chosen for modelling as detailed in section 8.5 of this document.

For prosulfuron it has been deemed appropriate to consider additional field degradation data (Hardy & Jastrzebski, 2015a). The field dissipation data originally submitted during the EU review was excluded from the EU assessment as it did not comply with latest guidance (EFSA, 2014a). New field trials were initiated in accordance with EFSA (2014a) resulting in the end-points proposed in Section 8.4, which further characterises the fate of prosulfuron in soils. For Tier 2 the PEC_{GW} values of prosulfuron have been assessed using the geometric mean field DT_{50} value of ~~20.8~~ 18.7 days proposed in Section 8.4 based on the new data provided for this assessment according to EFSA (2020).

Nicosulfuron:
The K_{FOC} value used in modelling for nicosulfuron and its metabolites was calculated based on the recommendation of the latest guidance for substance parameter selection (EFSA, 2014a). The individual values from which the geometric mean is calculated are those established in the EU review of nicosulfuron (EFSA, 2007) and Graham & Strachan (2008).

Dicamba:
The K_{FOC} value used in modelling for dicamba and its metabolite in soil DCSA were re-calculated based on the recommendation of the latest guidance for substance parameter selection (EFSA, 2014a). The individual values from which the geometric mean is calculated are those established in the EU review of dicamba (EFSA, 2011).

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

EU agreed endpoints were used for the predicted concentration in groundwater (PEC_{GW}) calculations of prosulfuron, nicosulfuron and dicamba and their respective metabolites.

Detailed summaries are provided in the table below.

[4] FOCUS (2014): Generic Guidance for Tier 1 FOCUS Ground Water Assessments, version 2.2
[5] EFSA (2014a): Guidance Document for evalauating laboratory and field dissipation studies to obtain DegT50 values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal 2014;12(5)3662

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

Use No	1, 2
Crop	Maize
Application rate (g as/ha)	Prosulfuron: 16 or 20 Nicosulfuron: 40 and 50 Dicamba: 160 and 200
Number of applications / interval (d)	1 / -
Relative application date / BBCH growth stage	3 days after emergence / 12-18
Crop interception (%)	25
Frequency of application	Prosulfuron: annual, biennial Nicosulfuron: triennial Dicamba: triennial
Models used for calculation	FOCUS PEARL v4.4.4, FOCUS PELMO v5.5.3, FOCUS MACRO v5.5.3

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

Crop	Scenario	Application dates (absolute)
Maize BBCH 12	Châteaudun	04-May (124)
	Hamburg	08-May (128)
	Kremsmünster	08-May (128)
	Okehampton	28-May (148)
	Piacenza	18-May (138)
	Porto	04-May (124)
	Sevilla	10-Mar (69)
	Thiva	23-Apr (113)

Numbers in brackets are corresponding Julian day numbers

8.8.2.1 Prosulfuron and its metabolites

The following PEC_{GW} modelling for prosulfuron and its metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707, CGA325025 and SYN547308 has not previously been reviewed and is provided in support of this assessment in Appendix 3 of this document.

For prosulfuron, a tiered approach was undertaken, the degradation and dissipation of prosulfuron were studied in soil under laboratory and field conditions, respectively; they were both considered in this modelling study and simulated separately as Tier 1 and Tier 2. Prosulfuron belongs to the class of sulfonylureas which are absorbed through both roots and shoots. Despite this, at Tier 1 a plant uptake factor of 0 was used for the parent as worst case. In the other tiers, a default plant uptake factor for systemic compounds of 0.15 was employed for the parent. (Tier 2a and 2b).

- The laboratory DT_{50} (Tier 1) was obtained from fifteen studies and details are given in the EFSA conclusion (EFSA, 2014). A normalised (20ºC/Q10 = 2.58, pF2) geometric mean value of 62.1 days was used for modelling. The ~~arithmetic~~ geometric mean sorption parameters were chosen as stated in the EU review of prosulfuron.

- The field DT_{50} (Tier 2) of ~~20.8 days~~[6] 18.7 days was used in modelling. Detailed field $DegT_{50}$ data (Tier 2, calculated in accordance with EFSA (2014) guidance for evaluating laboratory and field dissipation studies to obtain $DegT_{50}$ values) can be found in Table 8.4-32. ~~Tier 2 was further refined as explained below:~~ **Tier 2a** was further refined in a **Tier 2b** where the application pattern was changed to an application every 2nd year.
  - ~~At Tier 2a, the arithmetic mean sorption parameters were chosen as stated in the EU review of prosulfuron.~~
  - ~~According to current guidance the geometric mean K_{FOC} / K_{FOM} value was taken forward for modelling at Tier 2b (FOCUS, 2014; European Commission, 2014)~~[7,8]
  - ~~For Tier 2c the application pattern was changed to an application every 2nd year.~~

The different tiers can be summarised as follow:

- Tier 1: laboratory DT_{50} / plant uptake factor 0;
- Tier 2a: field DT_{50} / plant uptake factor 0.15 / application every year;
- Tier 2b: field DT_{50} / plant uptake factor 0.15 / application every 2nd year.

~~Prosulfuron belongs to the class of sulfonylureas which are absorbed through both roots and shoots. Consequently, at all Tiers a default plant uptake factor for systemic compounds of 0.5 was employed for the parent.~~

Table 8.8-3: Input parameters related to active substance prosulfuron, CGA150829, CGA159902 and CGA300406 for PEC_{GW} calculations

Compound	Prosulfuron	CGA150829	CGA159902	CGA300406	Value in accordance to EU endpoint Reference
Molar mass (g/mol)	419.4	140.1	253.2	405.4	Yes / EFSA, 2020 ~~2014~~
Water solubility (mg/L)	~~4000~~ 43000 (25°C)	1000 (20°C)	1000 (20°C)	1000 (20°C)	~~Yes / EFSA, 2014~~ Yes / EFSA, 2020
Saturated vapour pressure (Pa)	<3.5 × 10^{-6} (20°C)	0	0	0	Loss due to volatilisation was not considered → worst case
DT_{50} in soil (d) lab	62.1 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 10)[a]	~~196~~ 215.7 (~~median~~ geomean, normalisation to 10 kPa or pF2, 20 °C with Q10 of 2.58, n = ~~18~~ 19)	188 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q10 of 2.58, n = 5)	acidic soil: ~~4.3~~ 2.6 (~~max~~ min, n = 4)[9] alkaline soils: 30.2 (max, n = 3)	~~Yes / EFSA, 2014~~ Yes / EFSA, 2020
DT_{50} in soil (d) field	~~20.8~~ 18.7 (geomean normalisation to	-	-	-	~~No / Hardy& Jastrzebski, 2015~~

[6] ~~The value of 20.8 days was taken from the original issued report by Hardy & Jastrzebski, 2015. In the meantime the report was re-issued with a corrected geometric mean value of 21.2 days.~~
[7] ~~FOCUS (2014): Generic Guidance for FOCUS Surface Water Scenarios, version 1.2.~~
[8] ~~European Commission (2014) "Assessing Potential for Movement of Active Substances and their Metabolites to Ground Water in the EU" Report of the FOCUS Ground Water Work Group, EC Document Reference Sanco/13144/2010 version 3.~~

Compound	Prosulfuron	CGA150829	CGA159902	CGA300406	Value in accordance to EU endpoint Reference
	pF2, 20 °C with Q10 of 2.58, n = 6)				Yes / EFSA, 2020
Transformation rate lab[b], Tier 1	Pathway A 0.005246 to CGA300406 0.005916 to CO_2 Pathway B 0.003125 to CGA150829 0.004800 to CGA159902 0.003237 to CO_2 Pathway C 0.005581 to SYN547308 0.005581 to CO_2	0.003536 to CO_2	0.003687 to CO_2	~~0.141853~~ 0.234604 to SYN542604[c] ~~0.019344~~ 0.031991 to CGA325025[c] 0.020198 to SYN542604[d] 0.002754 to CGA325025[d]	Calculated
Transformation rate field[b], Tier 2	Pathway A ~~0.017515~~ 0.017421 to CGA300406 ~~0.019751~~ 0.019645 to CO_2 Pathway B ~~0.010434~~ 0.010379 to CGA150829 ~~0.016024~~ 0.015939 to CGA159902 ~~0.010807~~ 0.010749 to CO_2 Pathway C ~~0.018633~~ 0.018533 to SYN547308 ~~0.018633~~ 0.018533 to CO_2	0.003536 to CO_2	0.003687 to CO_2	~~0.141853~~ 0.234604 to SYN542604[c] ~~0.019344~~ 0.031991 to CGA325025[c] 0.020198 to SYN542604[d] 0.002754 to CGA325025[d]	Calculated
~~K_{FOC} / K_{FOM} (mL/g), Tier 1, Tier 2a~~	~~14.2/ 8.3 (arithmetic mean n = 8)~~	~~73.8 / 42.8 (arithmetic, n = 26)[e]~~	~~70.6 / 41.0 (arithmetic, n = 4)~~	~~46.9 / 27.2 (arithmetic, n = 3)~~	~~Yes / EFSA, 2014~~ ~~K_{FOM} calculated from K_{FOC} K_{FOM} = K_{FOC} / 1.724~~
K_{FOC} / K_{FOM} (mL/g)~~, Tier 2b, Tier 2c~~	11.7/ 6.8 (geomean, n = 8)	~~50.7 / 29.4~~ 45.6 / 26.5 (geomean,	68.0 / 39.4 (geomean, n = 4)	46.8 / 27.1 (geomean, n = 3)	~~Yes / EFSA, 2014~~ Yes /

Compound	Prosulfuron	CGA150829	CGA159902	CGA300406	Value in accordance to EU endpoint Reference
		n = ~~26~~27)[e]~~,~~ ~~[9]~~			EFSA, 2020 K_{FOM} calculated from K_{FOC} $K_{FOM} = K_{FOC}$ / 1.724
1/n	0.869 (arithmetic mean, n = 8)	~~0.858~~ 0.9 (arithmetic mean, n = ~~26~~27)[e] ~~[, 9]~~	0.880 (arithmetic mean, n = 4)	0.900 (arithmetic mean, n = 3)	~~Yes / EFSA, 2014~~ Yes / EFSA, 2020
Plant uptake factor	~~0.5~~ 0.15	0	0	0	~~Default for systemic compounds~~ Yes / EFSA, 2020
Formation fraction	-	0.280 from parent	0.430 from parent	0.470 from parent	Yes / EFSA, 2020 ~~2014~~
Conversion fraction[~~f~~ e]	-	0.094 from parent	0.260 from parent	0.454 from parent	Calculated
Washoff Factor (1/m) (PEARL)	0.0001	0.0001	0.0001	0.0001	Default
Foliar DT_{50} (d)	10	10	10	10	Default

[a] Total n=15; geometric mean of replicate soils calculated first
[b] For PELMO; (ln(2) / DT_{50}) * FFm
[c] Representing acidic soils
[d] Representing alkaline soils

~~[9] The parameter for the metabolites CGA150829 and CGA300406 (as a precursor of SYN542604, CGA349707 and CGA325025) are not in accordance with the parameter proposed by EFSA (2014). The following table juxtaposes worst-case results (in italics) for this assessment (parameter 1) with results of a recalculation with the EFSA parameter (parameter 2). All metabolites are classified as non-relevant and are still well below the threshold of 0.75 µg/L or 10 µg/L (CGA349707), respectively. Therefore the differences in input parameter would not result in a failed risk assessment.~~

~~**Worst-case PEC_{GW} results for metabolites**~~

~~Crop~~	~~Scenario~~	~~80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)~~							
		~~CGA150829~~		~~SYN542604~~		~~CGA349707~~		~~CGA325025~~	
		~~Parameter 1[a]~~	~~Parameter 2[b]~~	~~Parameter 1[c]~~	~~Parameter 2[d]~~	~~Parameter 1[c]~~	~~Parameter 2[d]~~	~~Parameter 1[c]~~	~~Parameter 2[d]~~
~~Maize 1 x 20 g a.s./ha~~	~~Hamburg~~	~~*0.119*~~	~~0.190~~	~~0.071~~	~~0.039~~	~~0.848~~	~~0.816~~	~~*0.109*~~	~~0.095~~
	~~Oke-hampton~~	~~0.096~~	~~0.134~~	~~*0.079*~~	~~0.048~~	~~0.491~~	~~0.490~~	~~0.067~~	~~0.060~~
	~~Thiva~~	~~0.099~~	~~0.187~~	~~0.023~~	~~0.006~~	~~*0.887*~~	~~0.787~~	~~0.067~~	~~0.053~~

~~[a] Parameter 1: K_{FOC} = 50.7 mL/g, 1/n = 0.858~~
~~[b] Parameter 2: K_{FOC} = 45.6 mL/g, 1/n = 0.900~~
~~[c] Parameter 1: DT_{50} for precursor (CGA300406) = 4.3 days~~
~~[d] Parameter 2: DT_{50} for precursor (CGA300406) = 2.6 days~~

~~[e] EFSA (2014) presents n=27. One K_{foc} and 1/n value was excluded from the calculation of the geomean value since 1/n with 1.422 was significantly outside the range of expected values i.e. below 0.6 or above 1.1.~~

[~~f~~ e] For use in FOCUS MACRO, formation fraction corrected for molar mass differences and multiplied along the pathway for secondary metabolites

Table 8.8-4: Input parameters related to the metabolites SYN542604, CGA349707, CGA325025 and SYN547308 for PEC_{GW} calculations

Compound	SYN542604	CGA349707	CGA325025	SYN547308	Value in accordance to EU endpoint Reference
Molar mass (g/mol)	381.3	338.3	404.4	449.4	Yes / EFSA, 2020 ~~2014~~
Water solubility (mg/L)	1000 (20°C)	1000 (20°C)	1000 (20°C)	1000 (20°C)	Yes / EFSA, 2020 ~~2014~~
Saturated vapour pressure (Pa)	0	0	0	0	Loss due to volatilisation was not considered → worst case
DT_{50} in soil (d) lab	84.6 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 8)~~[a]~~	153 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, ~~n = 4~~ n = 7)	62.4 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 3)	67.1 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = ~~3~~4)	~~Yes / EFSA, 2014~~ ~~No / Patel, 2014 for SYN547308~~ Yes / EFSA, 2020
Transformation rate[a]	0.007046 to CGA349707 0.001147 to CO_2	0.004530 to CO_2	0.011108 to CO_2	0.010330 to CO_2	Calculated
~~K_{FOC} / K_{FOM} (mL/g), Tier 1, Tier 2a~~	~~123 / 71.3 (arithmetic mean, n = 3)~~	~~44.4 / 25.8 (arithmetic mean, n = 3)~~	~~26.6 / 15.4 (arithmetic mean, n = 4)~~	~~131.2 / 76.1 (arithmetic mean, n = 5)~~	~~Yes / EFSA, 2014~~ ~~K_{FOM} calculated from K_{FOC} K_{FOM} = K_{FOC} / 1.724~~
K_{FOC} / K_{FOM} (mL/g)~~, Tier 2b, Tier 2c~~	111.1 / 64.5 (geomean, n = 3)	44.0 / 25.5 (geomean, n = 3)	26.2 / 15.2 (geomean, n = 4)	~~113.1 / 65.6 (geomean, n = 5)~~ 89.5 / 51.9 (geomean, n = 4)	~~Yes / EFSA, 2014~~ Yes / EFSA, 2020 K_{FOM} calculated from K_{FOC} K_{FOM} = K_{FOC} / 1.724
1/n	0.850 (arithmetic mean, n = 5)	0.960 (arithmetic mean, n = 3)	0.973 (arithmetic mean, n = 4)	~~0.933~~ 0.929 (arithmetic mean, n = ~~5~~4)	~~Yes / EFSA, 2014~~ Yes / EFSA, 2020
Plant uptake factor	0	0	0	0	Default

Compound	SYN542604	CGA349707	CGA325025	SYN547308	Value in accordance to EU endpoint Reference
Formation fraction	0.880 from CGA300406	0.860 from SYN542604	0.120 from CGA300406	0.5 from parent	Yes / EFSA, 2020 ~~2014~~
Conversion fraction[~~b~~ a]	0.376 from parent	0.287 from parent	0.054 from parent	0.536 from parent	Calculated
Washoff Factor (1/m) (PEARL)	0.0001	0.0001	0.0001	0.0001	Default
Foliar DT_{50} (d)	10	10	10	10	Default

~~[a] For PELMO; (ln(2) / DT_{50}) * FFm~~

[~~b~~ a] For use in FOCUS MACRO, formation fraction corrected for molar mass differences and multiplied along the pathway for secondary metabolites

Table 8.8-5: PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406, (with FOCUS PEARL v4.4.4) Tier 1 ($DT_{50,soil}$ 62.1d, PUF=0) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[a]~~			
		~~Prosulfuron~~	~~CGA150829~~	~~CGA159902~~	~~CGA300406~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.461~~	~~0.051~~	~~0.206~~	~~0.071~~
	~~Hamburg~~	~~0.705~~	~~0.058~~	~~0.231~~	~~0.095~~
	~~Kremsmünster~~	~~0.555~~	~~0.054~~	~~0.208~~	~~0.083~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.586~~	~~0.066~~	~~0.262~~	~~0.091~~
	~~Hamburg~~	~~0.900~~	~~0.075~~	~~0.293~~	~~0.121~~
	~~Kremsmünster~~	~~0.707~~	~~0.070~~	~~0.265~~	~~0.107~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[b]			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 16 g a.s./ha	Châteaudun	0.893	0.173	0.301	0.122
	Hamburg	1.46	0.185	0.317	0.145
	Kremsmünster	0.922	0.160	0.261	0.123
Maize 1 x 20 g a.s./ha	Châteaudun	1.14	0.219	0.386	0.157
	Hamburg	1.87	0.233	0.405	0.186
	Kremsmünster	1.17	0.203	0.334	0.157

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.

[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-6: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PEARL v4.4.4) Tier 1 (DT$_{50,soil}$ 62.1d, PUF=0) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PECGW at 1 m Soil Depth (µg/L) a~~			
		~~SYN542604~~	~~CGA349707~~	~~CGA325025~~	~~SYN547308~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.051~~	~~0.294~~	~~0.043~~	~~0.111~~
	~~Hamburg~~	~~0.045~~	~~0.487~~	~~0.051~~	~~0.092~~
	~~Kremsmünster~~	~~0.014~~	~~0.218~~	~~0.028~~	~~0.033~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.066~~	~~0.364~~	~~0.053~~	~~0.139~~
	~~Hamburg~~	~~0.058~~	~~0.609~~	~~0.065~~	~~0.117~~
	~~Kremsmünster~~	~~0.018~~	~~0.271~~	~~0.034~~	~~0.042~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)[b]			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 16 g a.s./ha	Châteaudun	0.096	0.559	0.071	0.253
	Hamburg	0.093	0.609	0.094	0.281
	Kremsmünster	0.095	0.427	0.060	0.250
Maize 1 x 20 g a.s./ha	Châteaudun	0.126	0.697	0.089	0.323
	Hamburg	0.121	0.759	0.118	0.357
	Kremsmünster	0.123	0.534	0.074	0.318

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC$_{GW}$ values are based on the adjusted parameterisation as described above.

[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-7: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PELMO v5.5.3) Tier 1 (DT$_{50,soil}$ 62.1d, PUF=0) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PECGW at 1 m Soil Depth (µg/L) a~~			
		~~Prosulfuron~~	~~CGA150829~~	~~CGA159902~~	~~CGA300406~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.267~~	~~0.035~~	~~0.150~~	~~0.045~~
	~~Hamburg~~	~~0.399~~	~~0.034~~	~~0.142~~	~~0.048~~
	~~Kremsmünster~~	~~0.423~~	~~0.038~~	~~0.149~~	~~0.059~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.343~~	~~0.046~~	~~0.192~~	~~0.057~~
	~~Hamburg~~	~~0.504~~	~~0.044~~	~~0.181~~	~~0.061~~
	~~Kremsmünster~~	~~0.540~~	~~0.049~~	~~0.189~~	~~0.075~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[b]			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 16 g a.s./ha	Châteaudun	0.798	0.187	0.319	0.115
	Hamburg	1.15	0.164	0.279	0.116
	Kremsmünster	0.975	0.155	0.276	0.116
Maize 1 x 20 g a.s./ha	Châteaudun	1.02	0.238	0.410	0.149
	Hamburg	1.47	0.207	0.356	0.148
	Kremsmünster	1.24	0.195	0.354	0.149

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-8: PEC_{GW} for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PELMO v5.5.3) Tier 1 ($DT_{50,soil}$ 62.1d, PUF=0) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[a]~~			
		~~SYN542604~~	~~CGA349707~~	~~CGA325025~~	~~SYN547308~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.034~~	~~0.364~~	~~0.042~~	~~0.070~~
	~~Hamburg~~	~~0.034~~	~~0.331~~	~~0.047~~	~~0.076~~
	~~Kremsmünster~~	~~0.042~~	~~0.320~~	~~0.042~~	~~0.088~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.045~~	~~0.454~~	~~0.052~~	~~0.090~~
	~~Hamburg~~	~~0.043~~	~~0.409~~	~~0.059~~	~~0.095~~
	~~Kremsmünster~~	~~0.054~~	~~0.397~~	~~0.052~~	~~0.111~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[b]			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 16 g a.s./ha	Châteaudun	0.097	0.606	0.073	0.244
	Hamburg	0.080	0.543	0.082	0.231
	Kremsmünster	0.095	0.465	0.065	0.223
Maize 1 x 20 g a.s./ha	Châteaudun	0.128	0.758	0.091	0.310
	Hamburg	0.103	0.677	0.102	0.294
	Kremsmünster	0.123	0.579	0.081	0.284

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-9: **PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406, (with FOCUS PEARL v4.4.4) Tier 2a ($DT_{50,soil}$ 18.7 d, PUF=0.15) (refer to A 3.3 De Vries, 2016[a])**

~~**Crop**~~	~~**Scenario**~~	~~**80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)**~~ [a]			
		~~**Prosulfuron**~~	~~**CGA150829**~~	~~**CGA159902**~~	~~**CGA300406**~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.025~~	~~0.042~~	~~0.188~~	~~0.024~~
	~~Hamburg~~	~~0.060~~	~~0.056~~	~~0.244~~	~~0.049~~
	~~Kremsmünster~~	~~0.044~~	~~0.046~~	~~0.188~~	~~0.045~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.034~~	~~0.055~~	~~0.244~~	~~0.032~~
	~~Hamburg~~	~~0.078~~	~~0.073~~	~~0.311~~	~~0.064~~
	~~Kremsmünster~~	~~0.059~~	~~0.060~~	~~0.242~~	~~0.058~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	**Scenario**	**80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)**[b]			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
Maize 1 x 16 g a.s./ha	Châteaudun	0.033	0.152	0.225	0.029
	Hamburg	0.080	0.184	0.287	0.058
	Kremsmünster	0.053	0.136	0.214	0.052
Maize 1 x 20 g a.s./ha	Châteaudun	0.043	0.194	0.294	0.038
	Hamburg	0.106	0.234	0.371	0.076
	Kremsmünster	0.069	0.174	0.275	0.069

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-10: **PEC_{GW} for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PEARL v4.4.4) Tier 2a ($DT_{50,soil}$ 18.7 d, PUF=0.15) (refer to A 3.3 De Vries, 2016[a])**

~~**Crop**~~	~~**Scenario**~~	~~**80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)**~~ [a]			
		~~**SYN542604**~~	~~**CGA349707**~~	~~**CGA325025**~~	~~**SYN547308**~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.029~~	~~0.542~~	~~0.060~~	~~0.047~~
	~~Hamburg~~	~~0.044~~	~~0.686~~	~~0.087~~	~~0.072~~
	~~Kremsmünster~~	~~0.043~~	~~0.476~~	~~0.061~~	~~0.071~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.040~~	~~0.681~~	~~0.075~~	~~0.061~~
	~~Hamburg~~	~~0.060~~	~~0.860~~	~~0.110~~	~~0.093~~
	~~Kremsmünster~~	~~0.057~~	~~0.596~~	~~0.077~~	~~0.093~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[b]			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 16 g a.s./ha	Châteaudun	0.041	0.599	0.066	0.104
	Hamburg	0.060	0.766	0.098	0.154
	Kremsmünster	0.057	0.513	0.066	0.137
Maize 1 x 20 g a.s./ha	Châteaudun	0.056	0.754	0.083	0.135
	Hamburg	0.081	0.962	0.123	0.200
	Kremsmünster	0.076	0.644	0.083	0.177

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-11: PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PELMO v5.5.3) Tier 2a ($DT_{50,soil}$ 18.7 d, PUF=0.15) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)~~[a]			
		~~Prosulfuron~~	~~CGA150829~~	~~CGA159902~~	~~CGA300406~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.010~~	~~0.028~~	~~0.140~~	~~0.012~~
	~~Hamburg~~	~~0.034~~	~~0.037~~	~~0.169~~	~~0.024~~
	~~Kremsmünster~~	~~0.031~~	~~0.036~~	~~0.158~~	~~0.029~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.013~~	~~0.037~~	~~0.181~~	~~0.016~~
	~~Hamburg~~	~~0.043~~	~~0.047~~	~~0.215~~	~~0.031~~
	~~Kremsmünster~~	~~0.041~~	~~0.048~~	~~0.202~~	~~0.039~~

[a] ~~only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[b]			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 16 g a.s./ha	Châteaudun	0.017	0.088	0.187	0.018
	Hamburg	0.049	0.099	0.218	0.032
	Kremsmünster	0.048	0.089	0.202	0.045
Maize 1 x 20 g a.s./ha	Châteaudun	0.022	0.114	0.243	0.024
	Hamburg	0.062	0.127	0.282	0.042
	Kremsmünster	0.064	0.114	0.259	0.061

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-12: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PELMO v5.5.3) Tier 2a (DT$_{50,soil}$ 18.7 d, PUF=0.15) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PECGW at 1 m Soil Depth (µg/L)~~ [a]			
		~~SYN542604~~	~~CGA349707~~	~~CGA325025~~	~~SYN547308~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.014~~	~~0.457~~	~~0.046~~	~~0.023~~
	~~Hamburg~~	~~0.024~~	~~0.472~~	~~0.057~~	~~0.043~~
	~~Kremsmünster~~	~~0.031~~	~~0.433~~	~~0.048~~	~~0.050~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.019~~	~~0.576~~	~~0.058~~	~~0.031~~
	~~Hamburg~~	~~0.032~~	~~0.589~~	~~0.071~~	~~0.057~~
	~~Kremsmünster~~	~~0.041~~	~~0.540~~	~~0.061~~	~~0.065~~

[a] ~~only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)[b]			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 16 g a.s./ha	Châteaudun	0.026	0.575	0.058	0.070
	Hamburg	0.040	0.611	0.076	0.121
	Kremsmünster	0.050	0.531	0.061	0.127
Maize 1 x 20 g a.s./ha	Châteaudun	0.037	0.726	0.073	0.092
	Hamburg	0.054	0.767	0.095	0.156
	Kremsmünster	0.067	0.665	0.077	0.164

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC$_{GW}$ values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-13: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PEARL v4.4.4) Tier 2b (DT$_{50,soil}$ 18.7 d, PUF=0.15; every 2nd year) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PECGW at 1 m Soil Depth (µg/L)~~ [a]			
		~~Prosulfuron~~	~~CGA150829~~	~~CGA159902~~	~~CGA300406~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.036~~	~~0.073~~	~~0.200~~	~~0.027~~
	~~Hamburg~~	~~0.085~~	~~0.092~~	~~0.252~~	~~0.052~~
	~~Kremsmünster~~	~~0.061~~	~~0.072~~	~~0.198~~	~~0.051~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.047~~	~~0.096~~	~~0.261~~	~~0.035~~
	~~Hamburg~~	~~0.112~~	~~0.119~~	~~0.325~~	~~0.069~~
	~~Kremsmünster~~	~~0.080~~	~~0.093~~	~~0.254~~	~~0.066~~

[a] ~~only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[b]			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 16 g a.s./ha	Châteaudun	0.018	0.076	0.107	0.016
	Hamburg	0.041	0.084	0.127	0.023
	Kremsmünster	0.028	0.069	0.102	0.024
Maize 1 x 20 g a.s./ha	Châteaudun	0.024	0.097	0.139	0.021
	Hamburg	0.055	0.107	0.163	0.031
	Kremsmünster	0.037	0.087	0.131	0.032

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-14: PEC_{GW} for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PEARL v4.4.4) Tier 2b (DT$_{50,soil}$ 18.7 d, PUF=0.15; every 2nd year) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[a]~~			
		~~SYN542604~~	~~CGA349707~~	~~CGA325025~~	~~SYN547308~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.037~~	~~0.540~~	~~0.060~~	~~0.067~~
	~~Hamburg~~	~~0.054~~	~~0.676~~	~~0.087~~	~~0.098~~
	~~Kremsmünster~~	~~0.053~~	~~0.472~~	~~0.061~~	~~0.103~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.049~~	~~0.678~~	~~0.075~~	~~0.087~~
	~~Hamburg~~	~~0.071~~	~~0.848~~	~~0.109~~	~~0.127~~
	~~Kremsmünster~~	~~0.071~~	~~0.591~~	~~0.077~~	~~0.134~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[b]			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 16 g a.s./ha	Châteaudun	0.018	0.298	0.034	0.054
	Hamburg	0.027	0.348	0.047	0.074
	Kremsmünster	0.024	0.260	0.033	0.064
Maize 1 x 20 g a.s./ha	Châteaudun	0.025	0.376	0.043	0.071
	Hamburg	0.036	0.436	0.059	0.094
	Kremsmünster	0.032	0.326	0.041	0.083

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-15: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PELMO v5.5.3) Tier 2b (DT$_{50,soil}$ 18.7 d, PUF=0.15; every 2nd year) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PECGW at 1 m Soil Depth (µg/L) [a]~~			
		~~Prosulfuron~~	~~CGA150829~~	~~CGA159902~~	~~CGA300406~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.014~~	~~0.054~~	~~0.147~~	~~0.013~~
	~~Hamburg~~	~~0.040~~	~~0.060~~	~~0.166~~	~~0.024~~
	~~Kremsmünster~~	~~0.044~~	~~0.058~~	~~0.162~~	~~0.035~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.019~~	~~0.070~~	~~0.190~~	~~0.017~~
	~~Hamburg~~	~~0.051~~	~~0.077~~	~~0.211~~	~~0.031~~
	~~Kremsmünster~~	~~0.058~~	~~0.075~~	~~0.206~~	~~0.046~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)[b]			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 16 g a.s./ha	Châteaudun	0.007	0.042	0.084	0.009
	Hamburg	0.022	0.049	0.104	0.013
	Kremsmünster	0.027	0.043	0.096	0.021
Maize 1 x 20 g a.s./ha	Châteaudun	0.010	0.054	0.110	0.012
	Hamburg	0.030	0.062	0.135	0.017
	Kremsmünster	0.035	0.055	0.124	0.028

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC$_{GW}$ values are based on the adjusted parameterisation as described above.

[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-16: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PELMO v5.5.3) Tier 2b (DT$_{50,soil}$ 18.7 d, PUF=0.15; every 2nd year) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PECGW at 1 m Soil Depth (µg/L) [a]~~			
		~~SYN542604~~	~~CGA349707~~	~~CGA325025~~	~~SYN547308~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.018~~	~~0.454~~	~~0.046~~	~~0.035~~
	~~Hamburg~~	~~0.027~~	~~0.451~~	~~0.055~~	~~0.061~~
	~~Kremsmünster~~	~~0.037~~	~~0.419~~	~~0.048~~	~~0.070~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.025~~	~~0.572~~	~~0.058~~	~~0.045~~
	~~Hamburg~~	~~0.036~~	~~0.562~~	~~0.069~~	~~0.078~~
	~~Kremsmünster~~	~~0.050~~	~~0.523~~	~~0.059~~	~~0.090~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	**Scenario**	**80^{th} Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[b]**			
		SYN542604	**CGA349707**	**CGA325025**	**SYN547308**
Maize 1 x 16 g a.s./ha	Châteaudun	0.012	0.280	0.029	0.034
	Hamburg	0.019	0.294	0.038	0.059
	Kremsmünster	0.021	0.267	0.032	0.063
Maize 1 x 20 g a.s./ha	Châteaudun	0.016	0.353	0.036	0.045
	Hamburg	0.026	0.369	0.048	0.075
	Kremsmünster	0.029	0.335	0.040	0.081

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

~~Table 8.8-17: PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PEARL v4.4.4) Tier 2c (refer to A 3.3 De Vries, 2016)~~

~~Crop~~	**~~Scenario~~**	**~~80^{th} Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[a]~~**			
		~~Prosulfuron~~	**~~CGA150829~~**	**~~CGA159902~~**	**~~CGA300406~~**
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.020~~	~~0.034~~	~~0.096~~	~~0.014~~
	~~Hamburg~~	~~0.044~~	~~0.040~~	~~0.111~~	~~0.022~~
	~~Kremsmünster~~	~~0.033~~	~~0.034~~	~~0.095~~	~~0.024~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.026~~	~~0.045~~	~~0.124~~	~~0.019~~
	~~Hamburg~~	~~0.058~~	~~0.052~~	~~0.143~~	~~0.028~~
	~~Kremsmünster~~	~~0.043~~	~~0.044~~	~~0.122~~	~~0.031~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

~~Table 8.8-18: PEC_{GW} for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PEARL v4.4.4) Tier 2c (refer to A 3.3 De Vries, 2016)~~

~~Crop~~	**~~Scenario~~**	**~~80^{th} Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[a]~~**			
		~~SYN542604~~	**~~CGA349707~~**	**~~CGA325025~~**	**~~SYN547308~~**
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.016~~	~~0.268~~	~~0.031~~	~~0.034~~
	~~Hamburg~~	~~0.023~~	~~0.310~~	~~0.042~~	~~0.048~~
	~~Kremsmünster~~	~~0.023~~	~~0.240~~	~~0.030~~	~~0.048~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.022~~	~~0.337~~	~~0.038~~	~~0.044~~
	~~Hamburg~~	~~0.031~~	~~0.388~~	~~0.053~~	~~0.062~~
	~~Kremsmünster~~	~~0.030~~	~~0.300~~	~~0.038~~	~~0.062~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

~~**Table 8.8-19: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PELMO v5.5.3) Tier 2c (refer to A 3.3 De Vries, 2016)**~~

~~**Crop**~~	~~**Scenario**~~	~~**80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)** [a]~~			
		~~**Prosulfuron**~~	~~**CGA150829**~~	~~**CGA159902**~~	~~**CGA300406**~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.006~~	~~0.024~~	~~0.067~~	~~0.007~~
	~~Hamburg~~	~~0.017~~	~~0.028~~	~~0.078~~	~~0.009~~
	~~Kremsmünster~~	~~0.023~~	~~0.028~~	~~0.078~~	~~0.016~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.008~~	~~0.031~~	~~0.088~~	~~0.009~~
	~~Hamburg~~	~~0.022~~	~~0.036~~	~~0.101~~	~~0.012~~
	~~Kremsmünster~~	~~0.029~~	~~0.036~~	~~0.101~~	~~0.021~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

~~**Table 8.8-20: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PELMO v5.5.3) Tier 2c (refer to A 3.3 De Vries, 2016)**~~

~~**Crop**~~	~~**Scenario**~~	~~**80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)** [a]~~			
		~~**SYN542604**~~	~~**CGA349707**~~	~~**CGA325025**~~	~~**SYN547308**~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.008~~	~~0.222~~	~~0.022~~	~~0.017~~
	~~Hamburg~~	~~0.013~~	~~0.215~~	~~0.028~~	~~0.028~~
	~~Kremsmünster~~	~~0.016~~	~~0.213~~	~~0.025~~	~~0.036~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.011~~	~~0.279~~	~~0.028~~	~~0.022~~
	~~Hamburg~~	~~0.017~~	~~0.269~~	~~0.035~~	~~0.036~~
	~~Kremsmünster~~	~~0.021~~	~~0.267~~	~~0.031~~	~~0.047~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Table 8.8-21: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with MACRO v5.5.4) Tier 1 (DT$_{50,soil}$ 62.1d, PUF=0) (refer to A 3.3 De Vries, 2016[a])

~~**Crop**~~	~~**Scenario**~~	~~**80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)**~~			
		~~**Prosulfuron**~~	~~**CGA150829**~~	~~**CGA159902**~~	~~**CGA300406**~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.287~~	~~0.034~~	~~0.144~~	~~0.043~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.367~~	~~0.044~~	~~0.184~~	~~0.055~~

Crop	**Scenario**	**80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)**			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
Maize 1 x 16 g a.s./ha	Châteaudun	0.562	0.143	0.229	0.039
Maize	Châteaudun	0.720	0.181	0.289	0.050

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
1 x 20 g a.s./ha					

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC$_{GW}$ values are based on the adjusted parameterisation as described above.

Table 8.8-22: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with MACRO v5.5.4) Tier 1 (DT$_{50,soil}$ 62.1d, PUF=0) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)~~			
		~~SYN542604~~	~~CGA349707~~	~~CGA325025~~	~~SYN547308~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.025~~	~~0.341~~	~~0.036~~	~~0.066~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.033~~	~~0.426~~	~~0.045~~	~~0.085~~

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 16 g a.s./ha	Châteaudun	0.012	0.051	0.054	0.158
Maize 1 x 20 g a.s./ha	Châteaudun	0.015	0.064	0.068	0.203

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC$_{GW}$ values are based on the adjusted parameterisation as described above.

Table 8.8-23: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with MACRO v5.5.4) Tier 2a (DT$_{50,soil}$ 18.7 d, PUF=0.15) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)~~			
		~~Prosulfuron~~	~~CGA150829~~	~~CGA159902~~	~~CGA300406~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.010~~	~~0.026~~	~~0.129~~	~~0.010~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.014~~	~~0.035~~	~~0.168~~	~~0.013~~

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 16 g a.s./ha	Châteaudun	0.014	0.115	0.154	0.005
Maize 1 x 20 g a.s./ha	Châteaudun	0.018	0.147	0.201	0.007

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC$_{GW}$ values are based on the

adjusted parameterisation as described above.

Table 8.8-24: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with MACRO v5.5.4) Tier 2a (DT$_{50,soil}$ 18.7 d, PUF=0.15) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)~~			
		~~SYN542604~~	~~CGA349707~~	~~CGA325025~~	~~SYN547308~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.004~~	~~0.358~~	~~0.031~~	~~0.022~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.005~~	~~0.450~~	~~0.038~~	~~0.029~~

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 16 g a.s./ha	Châteaudun	0.001	0.042	0.034	0.052
Maize 1 x 20 g a.s./ha	Châteaudun	0.001	0.052	0.043	0.068

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC$_{GW}$ values are based on the adjusted parameterisation as described above.

Table 8.8-25: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with MACRO v5.5.4) Tier 2b (DT$_{50,soil}$ 18.7 d, PUF=0.15; every 2nd year) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)~~			
		~~Prosulfuron~~	~~CGA150829~~	~~CGA159902~~	~~CGA300406~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.016~~	~~0.051~~	~~0.138~~	~~0.011~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.022~~	~~0.067~~	~~0.180~~	~~0.015~~

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 16 g a.s./ha	Châteaudun	0.007	0.056	0.070	0.003
Maize 1 x 20 g a.s./ha	Châteaudun	0.009	0.072	0.092	0.004

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC$_{GW}$ values are based on the adjusted parameterisation as described above.

Table 8.8-26: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with MACRO v5.5.4) Tier 2b (DT$_{50,soil}$ 18.7 d, PUF=0.15; every 2[nd] year) (refer to A 3.3 De Vries, 2016[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PECGW at 1 m Soil Depth (µg/L)~~			
		~~SYN542604~~	~~CGA349707~~	~~CGA325025~~	~~SYN547308~~
~~Maize 1 x 16 g a.s./ha~~	~~Châteaudun~~	~~0.006~~	~~0.360~~	~~0.031~~	~~0.033~~
~~Maize 1 x 20 g a.s./ha~~	~~Châteaudun~~	~~0.008~~	~~0.452~~	~~0.039~~	~~0.043~~

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 16 g a.s./ha	Châteaudun	<0.001	0.021	0.018	0.027
Maize 1 x 20 g a.s./ha	Châteaudun	<0.001	0.026	0.023	0.035

[a] The report sumarsed in A 3.3 (De Vries, 2016) depicts the original calculations, updated PEC$_{GW}$ values are based on the adjusted parameterisation as described above.

Calculation to assess risk of M17 leaching to groundwater

It was accepted that it was not technically feasible to identify M17. An assessment of its potential leaching was however made based on reasoned assumptions to provide a conservative worst case risk of exposure to groundwater. Details are provided below.

M17 was >5% (6.1%; maximum 0.007 mg/kg parent equivalent) at only the last sampling interval (120 days) of the aerobic route of degradation study (Fahrbach M., 2011)[10] conducted at 4 times the maximum proposed field rate of prosulfuron. Based on a maximum prosulfuron application rate of 20 g ai/ha to maize at growth stage BBCH 18 (crop interception 25%) and the maximum formation of 6.1% of M17, the loading of M17 to soil assuming a molecular mass of 254 as postulated , would be:-
(20 x 0.75 x 6.1 x 254)/100 x 419.4 = 0.55g M17/ha

Parent prosulfuron has a mean adsorption of 14.2 mL/g. All of the known 7 soil metabolites (CGA150829, CGA159902, SYN542604, CGA300406, CGA349707, CGA325025, SYN547308 (M18) all have significantly increased sorption (26.6 – 131 mL/g). However, taking a conservative approach and assuming that M17 has an adsorption comparable to parent prosulfuron and assuming a formation fraction of 1, (which is also likely to be conservative), the soil DT$_{50}$ would have to be in the order of >500 days, to produce a Predicted Environmental Concentration >0.1 µg/L for all scenarios other than Hamburg. For Hamburg, a DT$_{50}$ around 200 days would likely produce a PEC around 0.1 µg/L. The radiolabelled data (C95303 Fahrbach M., 2011)[10] supported a metabolite containing a phenyl ring and the NMR data supported the presence of a CF3 group; however the available MS data did not provide further reliable information to propose a definitive structure. It is however likely that the metabolite would have a low molecular mass around 254 and an empirical formula consistent with $C_9H_9SO_3F_3$.
With this information it is likely that the adsorption is more likely to be similar to that of CGA159902 i.e. mean around 70 mL/g. None of the known prosulfuron metabolites having the above chemical properties have a soil DT$_{50}$ >200 days (except CGA150829 which also contains the triazine ring and has a high molecular weight) and so it can be reasonably expected that there would be no unacceptable risk to groundwater especially when considering more realistic likely inputs.

[10] Fahrbach M., (2011): [14C]-Prosulfuron - Aerobic Soil Metabolism Study (Rate) in Four Soils Incubated at 20°C Harlan Laboratories Ltd., Itingen, Switzerland, C95314 GLP, Syngenta File No GA152005_10603

8.8.2.2 Nicosulfuron and its metabolites

The PEC_{GW} modelling for nicosulfuron and its metabolites HMUD, AUSN, ADMP, UCSN, ASDM and MU-466 has not previously been reviewed and is provided in support of this assessment in Appendix 3 of this document.

Table 8.8-27: Input parameters related to active substance nicosulfuron and metabolites HMUD, AUSN for PEC_{GW} calculations

Compound	Nicosulfuron	HMUD	AUSN	Value in accordance with EU endpoint / Reference
Molar mass (g/mol)	410.4	396.4	314.3	Yes / EFSA, 2007
Water solubility (mg/L)	9500 (25 °C)	9500 (25 °C)	9500 (25 °C)	Yes / EFSA, 2007 Metabolites: same value as for parent were used
Saturated vapour pressure (Pa)	0[a] (20 °C)	0 (20 °C)	0 (20 °C)	Yes / EFSA, 2007 Worst case assumption
DT_{50} in soil (d)	16.4 (geometric laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 7)	23.8 (geometric laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 2)	192.3 (maximum laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	Yes / EFSA, 2007
Transformation rate	0.018681 to HMUD 0.009045 to ASDM 0.009045 to ADMP 0.005494 to sink	0.020008 to AUSN 0.009116 to UCSN	0.003605 to sink	for PELMO; (ln(2) / DT_{50}) × FFm
K_{FOC} / K_{FOM} (mL/g)	24.6 / 14.3 (geometric mean, n = 14)	3.9 / 2.26 (geometric mean, n = 5)	13 / 7.54[b] (worst case, n = 4)~~- [c,d] (pH ≤ 6)~~ ~~22.3 / 12.9 [e]~~ ~~(6 < pH < 7)~~ ~~37.3 / 21.6 [f] (pH ≥ 7)~~	~~No[b] /~~ Yes / EFSA, 2007 ~~and~~ ~~Graham & Strachan, 2008 (nicosulfuron only)~~ K_{FOM} calculated from K_{FOC} $K_{FOM} = K_{FOC} / 1.724$
1/n	0.952 (arithmetic mean, n = 14)	0.90 (default value)	~~0.98- [c,d] (pH ≤ 6)~~ ~~0.96 [e] (6 < pH < 7)~~ ~~0.95 [f] (pH ≥ 7)~~	Yes / EFSA, 2007 ~~and~~ ~~Graham & Strachan, 2008 (nicosulfuron only)~~
Plant uptake factor	0	0	0	Yes / EFSA, 2007 and

Compound	Nicosulfuron	HMUD	AUSN	Value in accordance with EU endpoint / Reference
				Derz, 2013 for parent Worst case assumption
Formation fraction	0.442 to HMUD 0.214 to ASDM 0.214 to ADMP	0.687 to AUSN 0.313 to UCSN	NA	Yes / EFSA, 2007
Conversion fraction~~[g]~~ [c]	-	0.427	0.233	Calculated

[a] Measured value < 8 × 10^{-10} Pa for parent; loss due to volatilisation was not considered (i.e. set to 0) as worst-case for modelling
~~[b] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2007 and Graham & Strachan, 2008~~
[b] pH dependent sorption; worst case of Koc according to EFSA, 2007
~~[c] pH dependent sorption; value specific for Hamburg, Okehampton and Porto scenarios~~
~~[d] pH dependent sorption; value specific for Piacenza scenario~~
~~[e] pH dependent sorption; value specific for Sevilla scenario~~
~~[f] pH dependent sorption; value specific for Châteaudun, Kremsmünster and Thiva scenarios~~
~~[g]~~ [c] for use in FOCUS MACRO, formation fraction corrected for molar mass differences

Table 8.8-28: Input parameters related to nicosulfuron metabolites ADMP, UCSN, ASDM and MU-466 for PEC_{GW} calculations

Compound	ADMP	UCSN	ASDM	MU-466	Value in accordance with EU endpoint / Reference
Molar mass (g/mol)	155.2	315.3	229.2	215.1	Yes / EFSA, 2007
Water solubility (mg/L)	9500 (25 °C)	9500 (25 °C)	9500 (25 °C)	9500 (25 °C)	Yes / EFSA, 2007 Metabolites: same value as for parent were used
Saturated vapour pressure (Pa)	0 (20 °C)	0 (20 °C)	0 (20 °C)	0 (20 °C)	Yes / EFSA, 2007 Worst case assumption
DT_{50} in soil (d)	4.5 (geometric laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	271.0 (maximum laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	236.6 (maximum laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	75.5 (maximum laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	Yes / EFSA, 2007
Transformation rate	0.154033 to sink	0.002558 to sink	0.000826 to MU-466 0.002103 to sink	0.009181 to sink	for PELMO; (ln(2) / DT_{50}) × FFm
K_{FOC} / K_{FOM} (mL/g)	51.1 / 29.6 (geometric mean, n = 4)	2.6 / 1.5 (geometric mean, n = 4)	2.3 / 1.3[a] ~~[b,c] (pH ≤ 6)~~ ~~6.0 / 3.5 [d] (6 < pH < 7)~~ ~~7.2 / 4.2 [e] (pH ≥ 7)~~	2.97 / 1.7[a] ~~[b] (pH ≤ 6)~~ ~~5.4 / 3.1 [c,d] (6 < pH < 7)~~ ~~13.1 / 7.6 [e] (pH ≥ 7)~~	~~No[a] /~~ Yes / EFSA, 2007 K_{FOM} calculated from K_{FOC} K_{FOM} = K_{FOC} / 1.724

Compound	ADMP	UCSN	ASDM	MU-466	Value in accordance with EU endpoint / Reference
1/n	0.87 (arithmetic mean, n = 4)	0.90 (default value)	0.82[a] ~~[b,c] (pH ≤ 6)~~ ~~0.94 [d,e] (pH ≥ 7)~~	0.90 (default value)	Yes / EFSA, 2007
Plant uptake factor	0	0	0	0	Yes / EFSA, 2007 Worst case assumption
Formation fraction	NA	NA	0.282 to MU-466	NA	Yes / EFSA, 2007
Conversion fraction~~[f]~~ [b]	0.081	0.106	0.120	0.032	Calculated

~~[a] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2007~~

[a] pH dependent sorption; worst case of Koc according to EFSA, 2007

~~[b] pH dependent sorption; value specific for Hamburg, Okehampton and Porto scenarios~~

~~[c] pH dependent sorption; value specific for Piacenza scenario~~

~~[d] pH dependent sorption; value specific for Sevilla scenario~~

~~[e] pH dependent sorption; value specific for Châteaudun, Kremsmünster and Thiva scenarios~~

~~[f]~~ [b] for use in FOCUS MACRO, formation fraction corrected for molar mass differences

Table 8.8-29: PEC$_{GW}$ for nicosulfuron and metabolites on maize with FOCUS PEARL v4.4.4 (refer to A 3.5: González Camarero, 2020[a])

~~Crop~~	~~Scenario~~	~~80[th] Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)[a]~~						
		~~Nicosulfuron~~	~~HMUD~~	~~AUSN~~	~~UCSN~~	~~ASDM~~	~~ADMP~~	~~MU-466~~
~~Maize 1 × 40 g a.s./ha BBCH 12~~	~~Châteaudun~~	~~0.017~~	~~0.193~~	~~0.528~~	~~0.361~~	~~0.405~~	~~< 0.001~~	~~0.019~~
	~~Hamburg~~	~~0.039~~	~~0.363~~	~~0.751~~	~~0.407~~	~~0.469~~	~~< 0.001~~	~~0.023~~
	~~Kremsmünster~~	~~0.029~~	~~0.212~~	~~0.401~~	~~0.318~~	~~0.344~~	~~< 0.001~~	~~0.015~~
~~Maize 1 × 50 g a.s./ha BBCH 12~~	~~Châteaudun~~	~~0.022~~	~~0.244~~	~~0.662~~	~~0.450~~	~~0.506~~	~~< 0.001~~	~~0.024~~
	~~Hamburg~~	~~0.050~~	~~0.458~~	~~0.938~~	~~0.508~~	~~0.589~~	~~< 0.001~~	~~0.029~~
	~~Kremsmünster~~	~~0.037~~	~~0.268~~	~~0.502~~	~~0.398~~	~~0.431~~	~~< 0.001~~	~~0.019~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80[th] Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)[b]						
		Nicosulfuron	HMUD	AUSN	UCSN	ASDM	ADMP	MU-466
Maize 1 × 40 g a.s./ha BBCH 12	Châteaudun	0.017	0.193	0.664	0.361	0.407	< 0.001	0.023
	Hamburg	0.039	0.363	0.652	0.407	0.460	< 0.001	0.024
	Kremsmünster	0.029	0.212	0.545	0.318	0.351	< 0.001	0.019
Maize 1 × 50 g a.s./ha BBCH 12	Châteaudun	0.022	0.244	0.831	0.450	0.509	< 0.001	0.028
	Hamburg	0.050	0.458	0.816	0.508	0.579	< 0.001	0.029
	Kremsmünster	0.037	0.268	0.682	0.398	0.441	< 0.001	0.024

[a] The report sumarsed in A 3.5 (González Camarero, 2020) depicts the original calculations, updated PEC$_{GW}$ values are based on the adjusted parameterisation as described above.

[b] only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-30: PEC_{GW} for nicosulfuron and metabolites on maize with FOCUS PELMO v5.5.3 (refer to A 3.5 González Camarero, 2020[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PECGW at 1 m Soil Depth (µg/L)~~[a]						
		~~Nicosulfuron~~	~~HMUD~~	~~AUSN~~	~~UCSN~~	~~ASDM~~	~~ADMP~~	~~MU-466~~
~~Maize 1 × 40 g a.s./ha BBCH 12~~	~~Châteaudun~~	~~0.007~~	~~0.114~~	~~0.842~~	~~0.412~~	~~0.406~~	~~< 0.001~~	~~0.024~~
	~~Hamburg~~	~~0.020~~	~~0.250~~	~~0.799~~	~~0.371~~	~~0.407~~	~~< 0.001~~	~~0.022~~
	~~Kremsmünster~~	~~0.023~~	~~0.209~~	~~0.670~~	~~0.352~~	~~0.348~~	~~< 0.001~~	~~0.017~~
~~Maize 1 × 50 g a.s./ha BBCH 12~~	~~Châteaudun~~	~~0.009~~	~~0.143~~	~~1.05~~	~~0.515~~	~~0.509~~	~~< 0.001~~	~~0.030~~
	~~Hamburg~~	~~0.026~~	~~0.315~~	~~0.998~~	~~0.463~~	~~0.511~~	~~< 0.001~~	~~0.028~~
	~~Kremsmünster~~	~~0.029~~	~~0.263~~	~~0.836~~	~~0.441~~	~~0.436~~	~~< 0.001~~	~~0.021~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[b]						
		Nicosulfuron	HMUD	AUSN	UCSN	ASDM	ADMP	MU-466
Maize 1 × 40 g a.s./ha BBCH 12	Châteaudun	0.007	0.114	0.849	0.412	0.415	< 0.001	0.030
	Hamburg	0.020	0.250	0.799	0.371	0.402	< 0.001	0.023
	Kremsmünster	0.023	0.209	0.729	0.352	0.356	< 0.001	0.023
Maize 1 × 50 g a.s./ha BBCH 12	Châteaudun	0.009	0.143	1.06	0.515	0.522	< 0.001	0.038
	Hamburg	0.026	0.315	0.998	0.463	0.505	< 0.001	0.029
	Kremsmünster	0.029	0.263	0.911	0.441	0.449	< 0.001	0.028

[a] The report sumarsed in A 3.5 (González Camarero, 2020) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.8-31: PEC_{GW} for nicosulfuron and metabolites on maize with MACRO v5.5.4 (refer to A 3.5 González Camarero, 2020[a])

~~Crop~~	~~Scenario~~	~~80th Percentile PECGW at 1 m Soil Depth (µg/L)~~						
		~~Nicosulfuron~~	~~HMUD~~	~~AUSN~~	~~UCSN~~	~~ASDM~~	~~ADMP~~	~~MU-466~~
~~Maize 1 × 40 g a.s./ha BBCH 12~~	~~Châteaudun~~	~~0.009~~	~~0.103~~	~~0.389~~	~~0.360~~	~~0.356~~	~~< 0.001~~	~~0.026~~
~~Maize 1 × 50 g a.s./ha BBCH 12~~	~~Châteaudun~~	~~0.012~~	~~0.130~~	~~0.491~~	~~0.450~~	~~0.446~~	~~< 0.001~~	~~0.033~~

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)						
		Nicosulfuron	HMUD	AUSN	UCSN	ASDM	ADMP	MU-466
Maize 1 × 40 g a.s./ha BBCH 12	Châteaudun	0.009	0.103	0.389	0.360	0.372	< 0.001	0.046
Maize 1 × 50 g a.s./ha BBCH 12	Châteaudun	0.012	0.130	0.490	0.450	0.467	< 0.001	0.058

[a] The report sumarsed in A 3.5 (González Camarero, 2020) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.

Table 8.8-32: Summary of maximum PEC_{GW} across all models for nicosulfuron and its metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466 (refer to A 3.5 González Camarero, 2020[a])

~~Substance~~	~~80th Percentile PEC_{GW} (µg/L)~~	~~Crop~~	~~Application rate (g a.s./ha)~~	~~BBCH stage~~	~~Model and Version Number~~	~~Scenario~~
~~Nicosulfuron~~	~~0.052~~	~~Maize~~	~~1 × 40~~	~~12-18~~	~~PEARL v4.4.4~~	~~Okehampton~~
~~HMUD~~	~~0.363~~				~~PEARL v4.4.4~~	~~Hamburg~~
~~AUSN~~	~~1.43~~				~~PELMO v5.5.3~~	~~Thiva~~
~~UCSN~~	~~1.09~~				~~PEARL v4.4.4~~	~~Thiva~~
~~ASDM~~	~~0.983~~				~~PEARL v4.4.4~~	~~Thiva~~
~~ADMP~~	~~< 0.001~~				~~All models~~	~~All scenario~~
~~MU-466~~	~~0.067~~				~~PEARL v4.4.4~~	~~Thiva~~
~~Nicosulfuron~~	~~0.066~~	~~Maize~~	~~1 × 50~~	~~12-18~~	~~PEARL v4.4.4~~	~~Okehampton~~
~~HMUD~~	~~0.458~~				~~PEARL v4.4.4~~	~~Hamburg~~
~~AUSN~~	~~1.79~~				~~PELMO v5.5.3~~	~~Thiva~~
~~UCSN~~	~~1.37~~				~~PEARL v4.4.4~~	~~Thiva~~
~~ASDM~~	~~1.23~~				~~PEARL v4.4.4~~	~~Thiva~~
~~ADMP~~	~~< 0.001~~				~~All models~~	~~All scenarios~~
~~MU-466~~	~~0.085~~				~~PEARL v4.4.4~~	~~Thiva~~

Substance	80th Percentile PEC_{GW} (µg/L)	Crop	Application rate (g a.s./ha)	BBCH stage	Model and Version Number	Scenario
Nicosulfuron	0.052	Maize	1 × 40	12-18	PEARL v4.4.4	Okehampton
HMUD	0.363				PEARL v4.4.4	Hamburg
AUSN	1.56				PEARL v4.4.4	Thiva
UCSN	1.09				PEARL v4.4.4	Thiva
ASDM	1.00				PEARL v4.4.4	Thiva
ADMP	< 0.001				all models	all scenarios
MU-466	0.090				PEARL v4.4.4	Thiva
Nicosulfuron	0.066	Maize	1 × 50	12-18	PEARL v4.4.4	Okehampton
HMUD	0.458				PEARL v4.4.4	Hamburg
AUSN	1.95				PEARL v4.4.4	Thiva
UCSN	1.37				PEARL v4.4.4	Thiva
ASDM	1.26				PEARL v4.4.4	Thiva
ADMP	< 0.001				PEARL v4.4.4	all scenarios
MU-466	0.113				PEARL v4.4.4	Thiva

[a] The report sumarsed in A 3.5 (González Camarero, 2020) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.

8.8.2.3 Dicamba and its metabolites

The PEC_{GW} modelling for dicamba and its metabolite DSCA has not previously been reviewed and is provided in support of this assessment in Appendix 3 of this document.

Table 8.8-33: Input parameters related to active substance dicamba and DCSA for PEC_{GW} calculations

Compound	Dicamba	DSCA	Value in accordance to EU endpoint Reference
Molar mass (g/mol)	221	207	Yes / EFSA, 2011
Water solubility (mg/L)	6600 (25°C)	88,000 (25°C)	Yes / EFSA, 2011
Saturated vapour pressure (Pa)	1.67×10^{-3} (25°C)	1.0×10^{-6} (25°C)	Yes / EFSA, 2011 Worst case assumption
DT_{50} in soil (d) lab	4.0 (geometric mean, laboratory, normalisation to pF2, 20 °C with Q_{10} of 2.58, n = 4)	9.4 (geometric mean, laboratory, normalisation to pF2, 20 °C with Q_{10} of 2.58, n = 5)	Yes / EFSA, 2011
K_{FOC} / K_{FOM} (mL/g)	9.82 / 5.70 (geometric mean, n = 4)	877 / 509 (geometric mean, n = 5)	No[a] / EFSA, 2011 K_{FOM} calculated from K_{FOC} $K_{FOM} = K_{FOC} / 1.724$
1/n	0.74 (arithmetic mean, n = 4)	0.80 (arithmetic mean, n = 5)	Yes / EFSA, 2011
Plant uptake factor	0	0	Yes / EFSA, 2011 Worst case assumption
Formation fraction	-	0.75 from parent	Yes / EFSA, 2011
Transformation rate	0.1299651(to DCSA) 0.0433217 (to sink)	0.0737391 (to sink)	for PELMO; (ln(2) / DT_{50}) * FFm
Conversion fraction[b]	-	0.702	Calculated

[a] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2011
[b] for use in FOCUS MACRO, formation fraction corrected for molar mass differences

Table 8.8-34: PEC_{GW} for dicamba and DCSA on maize with FOCUS PEARL v4.4.4 (refer to A 3.7 González Camarero, 2020b)

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[a]	
		Dicamba	DCSA
Maize 1 × 160 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
	Hamburg	<0.001	<0.001
	Kremsmünster	<0.001	<0.001

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[a]	
		Dicamba	DCSA
Maize 1 × 200 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
	Hamburg	<0.001	<0.001
	Kremsmünster	<0.001	<0.001

[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3

Table 8.8-35: PEC_{GW} for dicamba and DCSA on maize (refer to A 3.7 González Camarero, 2020b)

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[a]	
		Dicamba	DCSA
Maize 1 × 160 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
	Hamburg	<0.001	<0.001
	Kremsmünster	<0.001	<0.001
Maize 1 × 200 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
	Hamburg	<0.001	<0.001
	Kremsmünster	<0.001	<0.001

[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3

Table 8.8-36: PEC_{GW} for dicamba and DCSA on maize with MACRO v5.5.4 (refer to A 3.7 González Camarero, 2020b)

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)[a]	
		Dicamba	DCSA
Maize 1 × 160 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
Maize 1 × 200 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001

Table 8.8-37: Summary of maximum PEC_{GW} across all models for dicamba and DCSA (refer to A 3.7 González Camarero, 2020b)

Substance	80th Percentile PEC_{GW} (µg/L)	Crop	Application rate (g a.s./ha)	BBCH stage	Model and Version Number	Scenario
Dicamba	< 0.001	Maize	1 x 160	12-18	All models	All scenarios
DCSA	< 0.001				All models	All scenarios
Dicamba	< 0.001	Maize	1 x 200	12-18	All models	All scenarios
DCSA	< 0.001				All models	All scenarios

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

zRMS Comments:

The reports with PECsw and PECsed calculations were submitted.

The recommended FOCUS models were used: FOCUS Step 1 & 2 and Step 3 and Step 4.
In accordance with intended use of formulation, only scenarios relevant for Poland were taken into consideration (D3, D4 and R1).
The SWAN and VFSmod models were used in Step 4 and the mitigation measures were proposed: vegetated and non-spray buffer zones.

The AppDate tool was used in selection of application dates. The application dates were accepted.

Prosulfuron. All used endpoints for active substance and its metabolites were agreed at the EU level and they were accepted. The tiered approach was used. The geom mean DT_{50} in soil from laboratory and field studies were used in PECsw/sed assessment at Tier 1 and Tier 2, respectively.
At Tier 1 the DT_{50} in soil of 62.1 d and the PUF = 0 were used.
The Tier 2 the DT_{50} in soil of 18.7 d and PUF=0.15 were used and accepted.
This approach was agreed at the EU level.
The max PECsw and relevant mitigation measure are presented in the table below.

Step 4. Maize

Crop	Application rate g a.s./ha	Mitigation measure	Max PEC_{sw} (µg/L)	Mitigation measure	Max PEC_{sw} (µg/L)
		SWAN model		VFSmod	
Maize	1 x 16	20 m vegetative strip and 20 m non-spray buffer strip	0.480 D4 pond	5 m vegetative strip	0.057 R1 stream
	1 x 20	20 m vegetative strip and 20 m non-spray buffer strip	0.612 D4 pond	5 m vegetative strip	0.071

Metabolites of prosulfuron. The Step 2 max PECsw and PECsed for higher application rate and Tier 1 are presented in the table below:

Metabolites of prosulfuron, Application rate 1 x 20 g a.s./ha in maize

Compound	Step 2 Max PEC_{sw} (µg/L)	Step 2 Max PEC_{SED} (µg/kg)
CGA150829	0.155	0.070
CGA159902	0.395	0.268
CGA300406	0.518	0.242
SYN542604	0.462	0.511
CGA349707	0.309	0.136
CGA325025	0.230	0.060

Nicosulfuron. PECsw and PECsed were determined at Steps 1 to 4 for the active substance nicosulfuron and Steps 1 and 2 for its relevant metabolites.
The used endpoints for active substance were accepted.
In Step 4 the SWAN model and VFSmod were used and relevant mitigation measures were proposed and they are presented in the table below.

SWAN model.

Crop	Application rate g a.s./ha	Mitigation measure	Max PEC_{sw} (µg/L)
Maize	1 x 40	10 m vegetative strip and 10 m non-spray buffer strip	0.183 R1 stream
		20 m vegetative strip and 20 m non-spray buffer strip	0.092 R1 stream
	1 x 50	10 m vegetative strip and 10 m non-spray buffer strip	0.228 R1 stream
		20 m vegetative strip and 20 m non-spray buffer strip	0.115 R1 stream

VFSmod model.

Crop	Application rate g a.s./ha	Mitigation measure	Max PEC_{sw} (µg/L)

Maize	1 x 40	5 m vegetative buffer strip	0.143 R1 stream
	1 x 50	5 m vegetative buffer strip	0.178 R1 stream

Metabolites of nicosulfuron. For metabolites the DT_{50} in water, sediment and whole system the used values were agreed at the EU level. The Kfoc values for metabolites are correct, but their description is wrong.

Metabolites of nicosulfuron, Application rate 1 x 40 g a.s./ha and 50 g a.s./ha in maize

Compound	**Step 2** **Max PEC_{sw}** **(µg/L)**	**Step 2** **Max PEC_{SED}** **(µg/kg)**	**Step 2** **Max PEC_{sw}** **(µg/L)**	**Step 2** **Max PEC_{SED}** **(µg/kg)**
Application rate g a.s./ha	**40**	**40**	**50**	**50**
HMUD	0.628	0.025	0.785	0.031
AUSN	0.570	0.074	0.712	0.093
ADMP	0.028	0.014	0.034	0.018
UCSN	0.269	0.007	0.336	0.009
ASDM	0.805	0.019	1.01	0.023

Dicamba. The used endpoints were agreed at the EU level.
The agreed value of Kfoc = 12.36 L/kg should be used in PECsw/sed assessment; the lower value was used by the Applicant (of 9.82 L/kg), as it represents a worse case – this approach was accepted.
The active substance and its metabolite were taken into consideration in Step 1 and 2 (North Europe, March-May application, average crop cover).

Step 2, Application rate 1 x 160 g a.s./ha in maize

Compound	**Step 2** **Max PEC_{sw}** **(µg/L)**	**Step 2** **Max PEC_{SED}** **(µg/kg)**	**Step 2** **Max PEC_{sw}** **(µg/L)**	**Step 2** **Max PEC_{SED}** **(µg/kg)**
Application rate g a.s./ha	**160**		**200**	
Dicamba	5.40	0.530	6.75	0.662
DSCA	2.29	19.5	2.86	24.3

Additionally, the Applicant has submitted the PECsw and PECsed assessment using Step 3 tool. This assessment was accepted and maximum value of PECsw and PECsed are presented in the table below.

Step 3. Application rate 1 x 160 g a.s./ha and 200 g a.s./ha in maize

Compound	**Max PEC_{sw}** **(µg/L)**	**Max PEC_{SED}** **(µg/kg)**	**Max PEC_{sw}** **(µg/L)**	**Max PEC_{SED}** **(µg/kg)**

Application rate g a.s./ha	**160**		**200**	
Dicamba	1.47 R1 stream	0.137 D3 ditch	1.83 R1 stream	0.167 D3 ditch

No mitigation measures were proposed.

Formulation. The PECsw of formulation submitted by the Applicant was accepted; the maximumapplication rate was taken into consideration – 500 f prod/ha. The drift exposure is presented below.

Crop	Maximum use rate (g A18385B /ha)	Drift[a] (distance from crop)	Drift reducing nozzle (%)	PEC_{SW} (µg A18385B /L)
Maize	500	2.77% (1 m)	-	4.62
			50	2.31
			75	1.15
			90	0.462
		0.57 (5 m)	-	0.950
			50	0.475
			75	0.238
			90	0.095

The relevant PECsw and PECsed values will be used in further risk assessment.
The relevant mitigation measure will be recommended in ecotoxicological section.

Unless otherwise stated, EU agreed endpoints refer to those stated in the EU review of prosulfuron (Prosulfuron, EFSA Journal 2014; 12(9): 3815; Prosulfuron, EFSA Journal 2020;18(7):6181), nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007) 120, 1-91) and dicamba (Dicamba, EFSA Journal 2011; 9(1):1965).

8.9.1 Justification for new endpoints

Prosulfuron:

~~For prosulfuron EFSA (2014) gives arithmetic mean K_{FOC} / K_{FOM} values. However, according to recent guidance (FOCUS, 2015; EFSA, 2014a)[11,12] geometric mean sorption parameter were chosen for modelling as detailed in section 8.5 of this document.~~

EU agreed endpoints were used for PEC_{SW} modelling of prosulfuron and its metabolites.

The $PEC_{SW/SED}$ of prosulfuron has been assessed with the FOCUS surface water model FOCUS STEPS 1-2 (Step 1 and 2 simulations), FOCUS SWASH (Step 3 simulations) and SWAN (Step 4 simulations). For prosulfuron it has been deemed appropriate to consider additional field degradation data (Hardy & Jastrzebski, 2015a). The field dissipation data originally submitted during the EU review was excluded from the EU assessment as it did not comply with latest guidance (EFSA, 2014a). New field trials were initiated in accordance with EFSA (2014a) resulting in the end-points proposed in Section 8.4, which further characterises the fate of prosulfuron in soils. For Tier 2 the PEC_{SW} values of prosulfuron have

~~[11] FOCUS (2015): Generic Guidance for FOCUS Surface Water Scenarios, version 1.4~~
~~[12] EFSA (2014): Guidance Document for evalauating laboratory and field dissipation studies to obtain DegT50 values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal 2014;12(5)3662~~

been assessed using the geometric mean field DT_{50} value of 18.7 days proposed in Section 8.4 based on the new data provided for this assessment according to EFSA (2020).

Nicosulfuron:
The K_{FOC} value used in modelling for nicosulfuron and its metabolites was calculated based on the recommendation of the latest guidance for substance parameter selection (EFSA, 2014a). The individual values from which the geometric mean is calculated are those established in the EU review of nicosulfuron (EFSA, 2007) and Graham & Strachan (2008).

Dicamba:
The K_{FOC} value used in modelling for dicamba and its metabolite in soil DCSA were re-calculated based on the recommendation of the latest guidance for substance parameter selection (EFSA, 2014a). The individual values from which the geometric mean is calculated are those established in the EU review of dicamba (EFSA, 2011).

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

EU agreed endpoints were used for the predicted concentration in surface water ($PEC_{SW/SED}$) calculations of prosulfuron, nicosulfuron and dicamba and their respective metabolites.

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

Plant protection product	A18385B	
Use No	1	2
Crop	Maize	Maize
Application rate (g as/ha)	Prosulfuron: 16 Nicosulfuron: 40 Dicamba: 160	Prosulfuron: 20 Nicosulfuron: 50 Dicamba: 200
Number of applications/interval (d)	1 / -	1 / -
Application window (relevant for STEP 1 and 2 only)	Mar-May	
Interception class (relevant for STEP 1 and 2 only)	Minimal crop cover	
Application method	Foliar Spray	
CAM (Chemical application method)	2 (application foliar linear)	
Soil depth (cm)	4 (default)	
Models used for calculation	Prosulfuron: FOCUS-STEPS 1-2 v3.2, FOCUS SWASH v5.3, FOCUS PRZM v4.3.1, FOCUS MACRO v5.5.4, FOCUS TOXWA v4.4.3[a], ECPA SWAN v4.0.1[a] Nicosulfuron: FOCUS-STEPS 1-2 v3.2, FOCUS SWASH v5.3, FOCUS PRZM v4.3.1, FOCUS MACRO v5.5.4, FOCUS TOXWA v5.5.3, ECPA SWAN v5.0 Dicamba: FOCUS-STEPS 1-2 v3.2; no STEP 3 and 4 calculations were performed	

[a] even though the calculations were done with previous versions of (i) TOXSWA and (ii) SWAN, this has no impact on the results. The model updates either include (i,ii) formatting improvements and bug fixing and (ii) support the use of the metabolite option. Both have no bearing on the presented results.

Table 8.9-2: FOCUS Step 3 Scenario related input parameters for $PEC_{SW/SED}$ calculations for the application of A18385B

Crop	Scenario	Prosulfuron & Nicosulfuron	
		First date of application window	**Last date of application window**
Maize	D3	8-May (128)	7-Jun (158)
	D4	13-May (133)	12-Jun (163)
	D5	13-May (133)	12-Jun (163)
	D6	23-Apr (113)	23-May (143)
	R1	6-May (126)	5-Jun (156)
	R2	4-May (124)	3-Jun (154)
	R3	4-May (124)	3-Jun (154)
	R4	13-Apr (103)	13-May (133)

Numbers in brackets are the corresponding 'Julian Day' numbers

8.9.2.1 Prosulfuron and its metabolites

The PEC_{SW} / PEC_{SED} modelling for prosulfuron, CGA150829, CGA159902, CGA300406, SYN542604, CGA349707 and CGA325025 has not previously been reviewed and is provided in support of this assessment in Appendix 3 of this document.

For prosulfuron, a tiered approach was undertaken, the degradation and dissipation of prosulfuron were studied in soil under laboratory and field conditions, respectively; they were both considered in this modelling study and simulated separately in different tiers.

- The laboratory DT_{50} (Tier 1) was obtained from fifteen studies and details are given in the EFSA conclusion (EFSA, 2014; EFSA, 2020). A normalised (20ºC/Q10 = 2.58, pF2) geometric mean value of 62.1 days was used for modelling. Prosulfuron belongs to the class of sulfonylureas which are absorbed through both roots and shoots. Despite this, at Tier 1 a plant uptake factor of 0 was used for the parent as worst case. In the other tiers a default plant uptake factor for systemic compounds of 0.15 was employed for the parent (Tier 2).
- The field DT_{50} (Tier 2) of 18.7 days was used in modelling, according to EFSA conclusion (2020). Detailed field $DegT_{50}$ data can be found in Table 8.4-3.

The different tiers can be summarized as follow:

- Tier 1: laboratory DT_{50} / plant uptake factor 0
- Tier 2: field DT_{50} / plant uptake factor 0.15.

Table 8.9-3: Input parameters related to active substance prosulfuron for $PEC_{SW/SED}$ calculations STEP 1/2 and 3/4 and metabolites CGA150829, CGA159902, CGA300406 for $PEC_{SW/SED}$ calculations STEP 1/2

Compound	**Prosulfuron**	**CGA150829**	**CGA159902**	**CGA300406**	**Value in accordance to EU endpoint / Reference**
Molar mass (g/mol)	419.4	140.1	253.2	405.4	Yes / EFSA, 2014
Water solubility (mg/L)	~~4000~~ 43000 (25°C)	1000 (20°C)	1000 (20°C)	1000 (20°C)	~~Yes /~~ ~~EFSA, 2014~~ Yes / EFSA, 2020
Saturated vapour pressure (Pa)	0 (20°C)	*	*	*	Worst case used for modelling, → worst case EFSA, 2020 ~~2014~~
Diffusion coefficient in water (m²/d)	4.3 x 10^{-5}	*	*	*	FOCUS default
Diffusion coefficient in air (m²/d)	0.43	*	*	*	FOCUS default
K_{FOC} (mL/g)	11.7 (geomean, n = 8)	~~50.7 (geomean, n = 26)~~ 45.6 (geomean, n = 27)	68 (geomean, n = 4)	46.8 (geomean, ~~n = 4~~ n = 3)	~~Yes /~~ ~~EFSA, 2014~~ Yes / EFSA, 2020
Freundlich Exponent 1/n	0.87 (arithmetic mean, n = 8)	*	*	*	Yes / EFSA, 2020 ~~2014~~
Plant Uptake	0.5	*	*	*	Default for systemic compounds
Wash-Off factor from Crop (1/mm)	0.05 (MACRO) 0.50 (PRZM)	*	*	*	FOCUS default
$DT_{50,soil}$ (d), laboratory Tier 1	62.1 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n =10)	~~196 (median, n = 18)~~ 215.7 (geomean, n = 19)	188 (geomean, n = 5)	9.1 (geomean, n = 4)	~~Yes /~~ ~~EFSA, 2014~~ Yes / EFSA, 2020
$DT_{50,soil}$ (d), field Tier 2	~~20.8~~ 18.7 (geomean normalisation to pF2, 20 °C with Q10 of 2.58, n = 6)	-	-	-	~~No /~~ ~~Hardy & Jastrzebski, 2015~~ Yes / EFSA, 2020
$DT_{50,water}$ (d)	(whole system) 173 (geomean, n = 4)	1000 (default)	1000 (default)	1000 (default)	Yes / EFSA, 2014
$DT_{50,sed}$ (d)	1000	1000 (default)	1000 (default)	1000 (default)	Yes /

Compound	Prosulfuron	CGA150829	CGA159902	CGA300406	Value in accordance to EU endpoint / Reference
					EFSA, 2014
$DT_{50,whole\ system}$ (d)	173 (geomean, n = 4)	1000 (default)	1000 (default)	1000 (default)	Yes / EFSA, 2014
Maximum occurrence observed (% molar basis with respect to the parent)	-	Soil: 40.6 Total system: 7.9	Soil: 47.4 Total system: 21.6	Soil: 24.0 Total system: 34.3	Yes / EFSA, 2014
Formation fraction in soil:	-	0.280 from parent	0.430 from parent	0.470 from parent	Yes / EFSA, 2014

* Not required for Steps 1 & 2

Table 8.9-4: Input parameters related to metabolites SYN542604, CGA349707 and CGA325025 for $PEC_{SW/SED}$ calculations STEP 1/2

Compound	SYN542604	CGA349707	CGA325025	Value in accordance to EU endpoint / Reference
Molar mass (g/mol)	381.3	338.3	404.4	Yes / EFSA, 2014
Water solubility (mg/L)	1000 (20°C)	1000 (20°C)	1000 (20°C)	Yes / EFSA, 2014
K_{FOC} (mL/g)	111.1 (geomean, n = ~~5~~ 3)	44.0 (geomean, n = 3)	26.2 (geomean, n = 4)	Yes / EFSA, 2014
Freundlich Exponent 1/n	*	*	*	-
$DT_{50,soil}$ (d), laboratory	84.6 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 8)[a]	153 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, ~~n = 4~~ n = 5)	62.4 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 3)	~~Yes / EFSA, 2014~~ Yes / EFSA, 2020
$DT_{50,water}$ (d)	1000	1000	1000	Default
$DT_{50,sed}$ (d)	1000	1000	1000	Default
$DT_{50,whole\ system}$ (d)	1000	1000	1000	Default
Maximum occurrence observed (% molar basis with respect to the parent)	Soil: 30.8 Total system: 24.8	Soil: 22.6 Total system: 16.1	Soil: 17.4 Total system: 7.0	Yes / EFSA, 2014
Formation fraction in soil:	0.880 from CGA300406	0.860 from SYN542604	0.120 from CGA300406	Yes / EFSA, 2014

* Not required for Steps 1 & 2
[a] Total n=11; geometric mean of replicate soils calculated first

$PEC_{SW/SED}$

Table 8.9-5: FOCUS Step 1, 2 and 3 PEC_{SW} and PEC_{SED} for prosulfuron following single application of 16 g a.s./ha to maize at Tier 1 ($DT_{50,soil}$ 62.1 d, PUF=0) (refer to A 3.4 De Vries, 2016a[a])

~~Scenario FOCUS~~	~~Waterbody~~	~~Max PEC_{SW} (µg/L)*~~	~~Dominant entry route~~	~~7 d- $PEC_{SW,TWA}$ (µg/L)**~~	~~Max PEC_{SED} (µg/kg)~~
~~Step 1~~	~~—~~	~~5.40~~	~~—~~	~~—~~	~~0.629~~
~~Step 2~~					
~~Northern Europe~~	~~March-May~~	~~0.897~~	~~—~~	~~—~~	~~0.104~~
~~Southern Europe~~	~~March-May~~	~~1.65~~	~~—~~	~~—~~	~~0.192~~
~~Step 3~~					
~~D3~~	~~ditch~~	~~0.289~~	~~Drift~~	~~0.220~~	~~0.414~~
~~D4~~	~~pond~~	~~0.376~~	~~Drainage~~	~~0.375~~	~~0.570~~
~~D4~~	~~stream~~	~~0.189~~	~~Drainage~~	~~0.181~~	~~0.248~~
~~R1~~	~~pond~~	~~0.006~~	~~Runoff~~	~~0.005~~	~~0.006~~
~~R1~~	~~stream~~	~~0.172~~	~~Runoff~~	~~0.011~~	~~0.013~~

~~** Twa-time as required by ecotox~~
~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Scenario FOCUS	Period / Waterbody	Max PEC_{SW} (µg/L)[b]	Dominant entry route	7 d- $PEC_{SW,TWA}$ (µg/L)[c]	Max PEC_{SED} (µg/kg)
Step 1	-	5.40	-	5.32	0.629
Step 2					
Northern Europe	Mar-May	0.897	-	0.884	0.105
Southern Europe	Mar-May	1.65	-	1.63	0.193
Step 3					
D3	ditch	0.334	Drift	0.267	0.493
D4	pond	0.480	Drainage	0.480	0.720
D4	stream	0.238	Drainage	0.228	0.314
R1	pond	0.006	Runoff	0.006	0.006
R1	stream	0.178	Runoff	0.012	0.014

[a] The report sumarised in A 3.4 (De Vries, 2016a) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.
[c] Twa-time as required by ecotox

Table 8.9-6: **FOCUS Step 1, 2 and 3 PEC_{SW} and PEC_{SED} for prosulfuron following single application of 20 g a.s./ha to maize at Tier 1 ($DT_{50,soil}$ 62.1 d, PUF=0) (refer to A 3.4 De Vries, 2016a[a])**

~~Scenario FOCUS~~	~~Waterbody~~	~~Max PECsw (µg/L)~~	~~Dominant entry route~~	~~7 d- PECsw,TWA (µg/L)**~~	~~Max PECsed (µg/kg)~~
~~Step 1~~	~~---~~	~~6.75~~	~~---~~	~~---~~	~~0.786~~
~~Step 2~~					
~~Northern Europe~~	~~March-May~~	~~1.12~~	~~---~~	~~---~~	~~0.131~~
~~Southern Europe~~	~~March-May~~	~~2.06~~	~~---~~	~~---~~	~~0.240~~
~~Step 3~~					
~~D3~~	~~ditch~~	~~0.368~~	~~Drift~~	~~0.282~~	~~0.520~~
~~D4~~	~~pond~~	~~0.478~~	~~Drainage~~	~~0.477~~	~~0.714~~
~~D4~~	~~stream~~	~~0.240~~	~~Drainage~~	~~0.230~~	~~0.310~~
~~R1~~	~~pond~~	~~0.007~~	~~Runoff~~	~~0.007~~	~~0.007~~
~~R1~~	~~stream~~	~~0.214~~	~~Runoff~~	~~0.013~~	~~0.016~~

~~** Twa-time as required by ecotox~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Scenario FOCUS	Period / Waterbody	Max PEC_{SW} (µg/L)[b]	Dominant entry route	7 d- $PEC_{SW,TWA}$ (µg/L)[c]	Max PEC_{SED} (µg/kg)
Step 1	-	6.75	-	6.65	0.786
Step 2					
Northern Europe	Mar-May	1.12	-	1.11	0.131
Southern Europe	Mar-May	2.06	-	2.03	0.241
Step 3					
D3	ditch	0.426	Drift	0.342	0.619
D4	pond	0.612	Drainage	0.612	0.904
D4	stream	0.303	Drainage	0.290	0.394
R1	pond	0.007	Runoff	0.007	0.008
R1	stream	0.222	Runoff	0.015	0.017

[a] The report sumarised in A 3.4 (De Vries, 2016a) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.

[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

[c] Twa-time as required by ecotox

Table 8.9-7: **FOCUS Step 1, 2 and 3 PEC_{SW} and PEC_{SED} for prosulfuron following single application 16 g a.s./ha to maize at Tier 2 ($DT_{50,soil}$ 18.7 d, PUF=0.15) (refer to A 3.4 De Vries, 2016a[a])**

~~Scenario FOCUS~~	~~Waterbody~~	~~Max PEC_{SW} (µg/L)~~	~~Dominant entry route~~	~~7 d- $PEC_{SW,TWA}$ (µg/L)**~~	~~Max PEC_{SED} (µg/kg)~~
~~Step 1~~	~~---~~	~~5.40~~	~~--~~	~~--~~	~~0.629~~
~~Step 2~~					
~~Northern Europe~~	~~March-May~~	~~0.833~~	~~--~~	~~--~~	~~0.097~~
~~Southern Europe~~	~~March-May~~	~~1.52~~	~~--~~	~~--~~	~~0.177~~
~~Step 3~~					
~~D3~~	~~ditch~~	~~0.093~~	~~Drift~~	~~0.023~~	~~0.028~~
~~D4~~	~~pond~~	~~0.024~~	~~Drainage~~	~~0.024~~	~~0.043~~
~~D4~~	~~stream~~	~~0.075~~	~~Drift~~	~~0.014~~	~~0.017~~
~~R1~~	~~pond~~	~~0.005~~	~~Runoff~~	~~0.005~~	~~0.006~~
~~R1~~	~~stream~~	~~0.168~~	~~Runoff~~	~~0.010~~	~~0.013~~

~~** Twa-time as required by ecotox~~
~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Scenario FOCUS	Period / Waterbody	Max PEC_{SW} (µg/L)[b]	Dominant entry route	7 d- $PEC_{SW,TWA}$ (µg/L)[c]	Max PEC_{SED} (µg/kg)
Step 1	-	5.40	-	5.32	0.629
Step 2					
Northern Europe	Mar-May	0.823	-	0.811	0.096
Southern Europe	Mar-May	1.50	-	1.48	0.176
Step 3					
D3	ditch	0.090	Drift	0.020	0.022
D4	pond	0.018	Drainage	0.018	0.033
D4	stream	0.074	Drift	0.011	0.013
R1	pond	0.006	Runoff	0.005	0.006
R1	stream	0.172	Runoff	0.011	0.013

[a] The report sumarised in A 3.4 (De Vries, 2016a) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.
[c] Twa-time as required by ecotox

Table 8.9-8: FOCUS Step 1, 2 and 3 PEC_{SW} and PEC_{SED} for prosulfuron following single application 20 g a.s./ha to maize at Tier 2 ($DT_{50,soil}$ 18.7 d, PUF=0.15) (refer to A 3.4 De Vries, 2016a[a])

~~Scenario FOCUS~~	~~Waterbody~~	~~Max PEC$_{SW}$ (µg/L)*~~	~~Dominant entry route~~	~~7 d- PEC$_{SW,TWA}$ (µg/L)**~~	~~Max PEC$_{SED}$ (µg/kg)~~
~~Step 1~~	~~---~~	~~6.75~~	~~--~~	~~--~~	~~0.786~~
~~Step 2~~					
~~Northern Europe~~	~~March-May~~	~~1.04~~	~~--~~	~~--~~	~~0.121~~
~~Southern Europe~~	~~March-May~~	~~1.90~~	~~--~~	~~--~~	~~0.222~~
~~Step 3~~					
~~D3~~	~~ditch~~	~~0.117~~	~~Drift~~	~~0.030~~	~~0.035~~
~~D4~~	~~pond~~	~~0.031~~	~~Drainage~~	~~0.031~~	~~0.054~~
~~D4~~	~~stream~~	~~0.095~~	~~Drift~~	~~0.018~~	~~0.021~~
~~R1~~	~~pond~~	~~0.007~~	~~Runoff~~	~~0.006~~	~~0.007~~
~~R1~~	~~stream~~	~~0.210~~	~~Runoff~~	~~0.013~~	~~0.016~~

~~** Twa-time as required by ecotox~~
~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Scenario FOCUS	Period / Waterbody	Max PEC$_{SW}$ (µg/L)[b]	Dominant entry route	7 d- PEC$_{SW,TWA}$ (µg/L)[c]	Max PEC$_{SED}$ (µg/kg)
Step 1	-	6.75	-	6.65	0.786
Step 2					
Northern Europe	Mar-May	1.03	-	1.01	0.120
Southern Europe	Mar-May	1.88	-	1.85	0.219
Step 3					
D3	ditch	0.113	Drift	0.026	0.029
D4	pond	0.024	Drainage	0.024	0.042
D4	stream	0.093	Drift	0.014	0.016
R1	pond	0.007	Runoff	0.007	0.008
R1	stream	0.214	Runoff	0.014	0.016

[a] The report sumarised in A 3.4 (De Vries, 2016a) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.
[b] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.
[c] Twa-time as required by ecotox

FOCUS Step 4

Table 8.9-9: Global maximum PEC_{SW} values for prosulfuron, following single application of either 16 g a.s./ha or 20 g a.s./ha to maize (Tier 1 ($DT_{50,soil}$ 62.1 d, PUF=0)) according to the EU GAP according to surface water Step 4 (refer to A 3.4 De Vries, 2016a[a])

~~**Mitigation options**~~				
~~Vegetative strip (m)~~			~~10-12~~	~~18-20~~
~~No spray buffer (m)~~			~~10~~	~~20~~
~~Nozzle reduction (%)~~			~~-~~	~~-~~
~~**Crop**~~	~~**Scenario**~~	~~**Waterbody**~~	~~**PEC_{SW} (µg/L)**~~	~~**PEC_{SW} (µg/L)**~~
~~Maize 16 g a.s/ha BBCH 12-18~~	~~D3~~	~~Ditch~~	~~0.220~~	~~0.220~~
	~~D4~~	~~Pond~~	~~0.376~~	~~0.376~~
	~~D4~~	~~Stream~~	~~0.189~~	~~0.189~~
	~~R1~~	~~Pond~~	~~0.003~~	~~0.002~~
	~~R1~~	~~Stream~~	~~0.070~~	~~0.036~~
~~Maize 20 g a.s/ha BBCH 12-18~~	~~D3~~	~~Ditch~~	~~0.281~~	~~0.280~~
	~~D4~~	~~Pond~~	~~0.478~~	~~0.478~~
	~~D4~~	~~Stream~~	~~0.240~~	~~0.240~~
	~~R1~~	~~Pond~~	~~0.004~~	~~0.002~~
	~~R1~~	~~Stream~~	~~0.088~~	~~0.044~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Mitigation options					
Vegetative strip (m)			5[b]	10-12	18-20
No spray buffer (m)			-	10	20
Nozzle reduction (%)			-	-	-
Crop	**Scenario**	**Waterbody**	**PEC_{SW} (µg/L)[c]**	**PEC_{SW} (µg/L)[c]**	**PEC_{SW} (µg/L)[c]**
Maize 16 g a.s/ha BBCH 12-18	D3	Ditch	-	0.267	0.267
	D4	Pond	-	0.480	0.480
	D4	Stream	-	0.238	0.238
	R1	Pond	0.003	0.003	0.002
	R1	Stream	0.057	0.073	0.037
Maize 20 g a.s/ha BBCH 12-18	D3	Ditch	-	0.342	0.342
	D4	Pond	-	0.612	0.612
	D4	Stream	-	0.303	0.303
	R1	Pond	0.004	0.004	0.002
	R1	Stream	0.071	0.091	0.046

[a] The report sumarised in A 3.4 (De Vries, 2016a) depicts the original calculations, updated PEC_{GW} values are based on the adjusted parameterisation as described above.

[b] 5 m vegetated filter strip, simulated using VFSMod tool included in SWAN v 5.0.

[c] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Table 8.9-10: Global maximum PEC_{SW} values for prosulfuron, following single application of either 16 g a.s./ha or 20 g a.s./ha to maize (Tier 2 ($DT_{50,soil}$ 18.7 d, PUF=0.15)) according to the EU GAP according to surface water Step 4 (refer to A 3.4 De Vries, 2016a[a])

~~**Mitigation options**~~				
~~Vegetative strip (m)~~			~~10-12~~	~~18-20~~
~~No spray buffer (m)~~			~~10~~	~~20~~
~~Nozzle reduction (%)~~			~~-~~	~~-~~
~~**Crop**~~	~~**Scenario**~~	~~**Waterbody**~~	~~**PEC_{SW} (µg/L)**~~	~~**PEC_{SW} (µg/L)**~~
~~Maize 16 g a.s/ha BBCH 12-18~~	~~D3~~	~~Ditch~~	~~0.023~~	~~0.016~~
	~~D4~~	~~Pond~~	~~0.024~~	~~0.024~~
	~~D4~~	~~Stream~~	~~0.020~~	~~0.015~~
	~~R1~~	~~Pond~~	~~0.003~~	~~0.002~~
	~~R1~~	~~Stream~~	~~0.069~~	~~0.035~~
~~Maize 20 g a.s/ha BBCH 12-18~~	~~D3~~	~~Ditch~~	~~0.030~~	~~0.021~~
	~~D4~~	~~Pond~~	~~0.031~~	~~0.031~~
	~~D4~~	~~Stream~~	~~0.025~~	~~0.019~~
	~~R1~~	~~Pond~~	~~0.004~~	~~0.002~~
	~~R1~~	~~Stream~~	~~0.086~~	~~0.043~~

~~[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3~~

Mitigation options					
Vegetative strip (m)			5[b]	10-12	18-20
No spray buffer (m)			-	10	20
Nozzle reduction (%)			-	-	-
Crop	**Scenario**	**Waterbody**	**PEC_{SW} (µg/L)[c]**	**PEC_{SW} (µg/L)[c]**	**PEC_{SW} (µg/L)[c]**
Maize 16 g a.s/ha BBCH 12-18	D3	Ditch	-	0.021	0.013
	D4	Pond	-	0.018	0.018
	D4	Stream	-	0.019	0.012
	R1	Pond	0.003	0.003	0.002
	R1	Stream	0.057	0.071	0.036
Maize 20 g a.s/ha BBCH 12-18	D3	Ditch	-	0.026	0.017
	D4	Pond	-	0.024	0.024
	D4	Stream	-	0.024	0.015
	R1	Pond	0.004	0.004	0.002
	R1	Stream	0.071	0.088	0.044

[a] The report sumarsed in A 3.4 (De Vries, 2016a) depicts the original calculations, updated PEC_{GW} values are based on the

adjusted parameterisation as described above.
[b] 5 m vegetated filter strip, simulated using VFSMod tool included in SWAN v 5.0.
[c] Only relevant scenarios and worst-case results presented in table above, full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document.

Metabolites of prosulfuron

Table 8.9-11: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for CGA150829, CGA159902 and CGA300406 following single application to maize at Tier 1 (DT$_{50,soil}$ 62.1 d, PUF=0)

~~Use (g a.s./ha)~~	~~Region~~	~~Season~~	~~CGA150829~~		~~CGA159902~~		~~CGA300406~~	
			~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~
~~Maize 16 g a.s/ha BBCH 12-18~~	~~Step 1~~	~~—~~	~~0.813~~	~~0.412~~	~~2.06~~	~~1.40~~	~~2.88~~	~~1.34~~
	~~Step 2~~							
	~~Northern Europe~~	~~March-May~~	~~0.123~~	~~0.062~~	~~0.316~~	~~0.215~~	~~0.414~~	~~0.193~~
	~~Southern Europe~~	~~March-May~~	~~0.242~~	~~0.123~~	~~0.615~~	~~0.417~~	~~0.782~~	~~0.365~~
~~Maize 20 g a.s/ha BBCH 12-18~~	~~Step 1~~	~~—~~	~~1.02~~	~~0.515~~	~~2.57~~	~~1.75~~	~~3.60~~	~~1.68~~
	~~Step 2~~							
	~~Northern Europe~~	~~March-May~~	~~0.154~~	~~0.078~~	~~0.395~~	~~0.268~~	~~0.518~~	~~0.242~~
	~~Southern Europe~~	~~March-May~~	~~0.302~~	~~0.153~~	~~0.768~~	~~0.522~~	~~0.977~~	~~0.457~~

Use (g a.s./ha)	Region	Period	CGA150829		CGA159902		CGA300406	
			Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)
Maize 16 g a.s/ha BBCH 12-18	Step 1	-	0.818	0.373	2.06	1.40	2.88	1.35
	Step 2							
	Northern Europe	Mar-May	0.124	0.056	0.316	0.215	0.414	0.193
	Southern Europe	Mar-May	0.244	0.111	0.615	0.417	0.782	0.365
Maize 20 g a.s/ha BBCH 12-18	Step 1	-	1.02	0.466	2.57	1.75	3.60	1.68
	Step 2							
	Northern Europe	Mar-May	0.155	0.070	0.395	0.268	0.518	0.242
	Southern Europe	Mar-May	0.305	0.139	0.768	0.522	0.977	0.457

Table 8.9-12: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for SYN542604, CGA349707 and CGA325025 following single application to maize at Tier 1 ($DT_{50,soil}$ 62.1 d, PUF=0)

~~Use (g a.s./ha)~~	~~Region~~	~~Season~~	~~SYN542604~~		~~CGA349707~~		~~CGA325025~~	
			~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~
~~Maize 16 g a.s/ha BBCH 12-18~~	~~Step 1~~	~~—~~	~~2.38~~	~~2.64~~	~~1.59~~	~~0.699~~	~~1.22~~	~~0.320~~
	~~Step 2~~							
	~~Northern Europe~~	~~March-May~~	~~0.369~~	~~0.408~~	~~0.248~~	~~0.109~~	~~0.184~~	~~0.048~~
	~~Southern Europe~~	~~March-May~~	~~0.708~~	~~0.785~~	~~0.477~~	~~0.209~~	~~0.358~~	~~0.094~~
~~Maize 20 g a.s/ha BBCH 12-18~~	~~Step 1~~	~~—~~	~~2.98~~	~~3.30~~	~~1.99~~	~~0.874~~	~~1.53~~	~~0.400~~
	~~Step 2~~							
	~~Northern Europe~~	~~March-May~~	~~0.462~~	~~0.511~~	~~0.309~~	~~0.136~~	~~0.230~~	~~0.060~~
	~~Southern Europe~~	~~March-May~~	~~0.885~~	~~0.981~~	~~0.596~~	~~0.262~~	~~0.447~~	~~0.117~~

Use (g a.s./ha)	Region	Period	SYN542604		CGA349707		CGA325025	
			Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)
Maize 16 g a.s/ha BBCH 12-18	Step 1	-	2.38	2.64	1.59	0.699	1.22	0.320
	Step 2							
	Northern Europe	Mar-May	0.369	0.408	0.248	0.109	0.184	0.048
	Southern Europe	Mar-May	0.708	0.785	0.477	0.209	0.358	0.094
Maize 20 g a.s/ha BBCH 12-18	Step 1	-	2.98	3.30	1.99	0.874	1.53	0.400
	Step 2							
	Northern Europe	Mar-May	0.462	0.511	0.309	0.136	0.230	0.060
	Southern Europe	Mar-May	0.885	0.981	0.596	0.262	0.447	0.117

Table 8.9-13: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for CGA150829, CGA159902 and CGA300406 following single application to maize at Tier 2 ($DT_{50,soil}$ 18.7 d, PUF=0.15)

~~Use (g a.s./ha)~~	~~Region~~	~~Season~~	~~CGA150829~~		~~CGA159902~~		~~CGA300406~~	
			~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~
~~Maize~~	~~Step 1~~	~~—~~	~~0.813~~	~~0.412~~	~~2.06~~	~~1.40~~	~~2.88~~	~~1.34~~

~~Use (g a.s./ha)~~	~~Region~~	~~Season~~	~~CGA150829~~		~~CGA159902~~		~~CGA300406~~	
			~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~
~~16 g a.s/ha BBCH 12-18~~	~~Step 2~~							
	~~Northern Europe~~	~~March-May~~	~~0.121~~	~~0.061~~	~~0.309~~	~~0.209~~	~~0.394~~	~~0.184~~
	~~Southern Europe~~	~~March-May~~	~~0.239~~	~~0.121~~	~~0.599~~	~~0.407~~	~~0.741~~	~~0.346~~
~~Maize 20 g a.s/ha BBCH 12-18~~	~~Step 1~~	~~—~~	~~1.02~~	~~0.515~~	~~2.57~~	~~1.75~~	~~3.60~~	~~1.68~~
	~~Step 2~~							
	~~Northern Europe~~	~~March-May~~	~~0.152~~	~~0.077~~	~~0.386~~	~~0.262~~	~~0.493~~	~~0.230~~
	~~Southern Europe~~	~~March-May~~	~~0.298~~	~~0.151~~	~~0.749~~	~~0.509~~	~~0.927~~	~~0.433~~

Use (g a.s./ha)	**Region**	**Period**	**CGA150829**		**CGA159902**		**CGA300406**	
			Max PEC_{SW} (µg/L)	**Max PEC_{SED} (µg/kg)**	**Max PEC_{SW} (µg/L)**	**Max PEC_{SED} (µg/kg)**	**Max PEC_{SW} (µg/L)**	**Max PEC_{SED} (µg/kg)**
Maize 16 g a.s/ha BBCH 12-18	Step 1	-	0.818	0.373	2.06	1.40	2.88	1.35
	Step 2							
	Northern Europe	Mar-May	0.122	0.056	0.307	0.209	0.391	0.182
	Southern Europe	Mar-May	0.240	0.109	0.597	0.405	0.735	0.343
Maize 20 g a.s/ha BBCH 12-18	Step 1	-	1.02	0.466	2.57	1.75	3.60	1.68
	Step 2							
	Northern Europe	Mar-May	0.152	0.069	0.384	0.261	0.489	0.228
	Southern Europe	Mar-May	0.300	0.137	0.746	0.506	0.919	0.429

Table 8.9-14: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for SYN542604, CGA349707 and CGA325025 following single application to maize at Tier 2 ($DT_{50,soil}$ 18.7 d, PUF=0.15)

~~Use (g a.s./ha)~~	~~Region~~	~~Season~~	~~SYN542604~~		~~CGA349707~~		~~CGA325025~~	
			~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~
~~Maize 16 g a.s/ha BBCH 12-18~~	~~Step 1~~	~~—~~	~~2.38~~	~~2.64~~	~~1.59~~	~~0.699~~	~~1.22~~	~~0.320~~
	~~Step 2~~							
	~~Northern Europe~~	~~March-May~~	~~0.356~~	~~0.394~~	~~0.240~~	~~0.105~~	~~0.179~~	~~0.047~~
	~~Southern~~	~~March-~~	~~0.683~~	~~0.757~~	~~0.461~~	~~0.202~~	~~0.349~~	~~0.091~~

~~Use (g a.s./ha)~~	~~Region~~	~~Season~~	~~SYN542604~~		~~CGA349707~~		~~CGA325025~~	
			~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~	~~Max PEC_{SW} (µg/L)~~	~~Max PEC_{SED} (µg/kg)~~
	~~Europe~~	~~May~~						
~~Maize 20 g a.s/ha BBCH 12-18~~	~~Step 1~~	~~—~~	~~2.98~~	~~3.30~~	~~1.99~~	~~0.874~~	~~1.53~~	~~0.400~~
	~~Step 2~~							
	~~Northern Europe~~	~~March-May~~	~~0.446~~	~~0.493~~	~~0.299~~	~~0.132~~	~~0.224~~	~~0.059~~
	~~Southern Europe~~	~~March-May~~	~~0.853~~	~~0.946~~	~~0.576~~	~~0.253~~	~~0.436~~	~~0.114~~

Use (g a.s./ha)	Region	Period	SYN542604		CGA349707		CGA325025	
			Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)
Maize 16 g a.s/ha BBCH 12-18	Step 1	-	2.38	2.64	1.59	0.699	1.22	0.320
	Step 2							
	Northern Europe	Mar-May	0.354	0.392	0.238	0.105	0.179	0.047
	Southern Europe	Mar-May	0.679	0.752	0.458	0.201	0.348	0.091
Maize 20 g a.s/ha BBCH 12-18	Step 1	-	2.98	3.30	1.99	0.874	1.53	0.400
	Step 2							
	Northern Europe	Mar-May	0.443	0.490	0.298	0.131	0.223	0.059
	Southern Europe	Mar-May	0.848	0.940	0.573	0.252	0.435	0.114

8.9.2.2 Nicosulfuron and its metabolites

The PEC_{SW} / PEC_{SED} modelling for nicosulfuron and its metabolites HMUD, AUSN, ADMP, UCSN and ASDM has not previously been reviewed and is provided in support of this assessment in Appendix 3 of this document.

Table 8.9-15: Input parameters related to active substance nicosulfuron and metabolites HUMD and AUSN for $PEC_{SW/SED}$ calculations STEP 1/2 and 3/4

Compound	Nicosulfuron	HMUD	AUSN	Value in accordance to EU endpoint / Reference
Molar mass (g/mol)	410.4	396.4	314.3	Yes / EFSA, 2007
Water solubility (mg/L)	9500 (20 °C)	9500	9500	Yes / EFSA, 2007

Compound	Nicosulfuron	HMUD	AUSN	Value in accordance to EU endpoint / Reference
				Assumed same as parent value for metabolites
Saturated vapour pressure (Pa)	$< 8 \times 10^{-10}$ (25 °C)	-*	-*	Yes / EFSA, 2007
Diffusion coefficient in water (m^2/d)	4.3×10^{-5}	-*	-*	FOCUS default
Diffusion coefficient in air (m^2/d)	0.43	-*	-*	FOCUS default
K_{FOC} (mL/g)[a]	24.6 (geometric mean, n = 14)	3.9 (geometric mean, n = 5)	13 (worst case, n = 4)	No[b] / EFSA, 2007 and Graham & Strachan, 2008
Freundlich Exponent 1/n	0.94 (arithmetic mean, n = 4)	-*	-*	Yes / EFSA, 2007
Plant Uptake	0	-*	-*	FOCUS default
Wash-Off factor from Crop (1/mm)	0.05 (MACRO) 0.50 (PRZM)	-*	-*	FOCUS default
$DT_{50,soil}$ (d)	16.4 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n =7)	23.8 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n =2)	192.3 (maximum, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n =2)	Yes / EFSA, 2007
$DT_{50,water}$ (d) (Step2 / Step3/4)	65.0 / 42.3 (whole system value)	1000	1000	FOCUS default for metabolites
$DT_{50,sed}$ (d) (Step2 / Step3/4)	13.9 / 1000	1000	1000	FOCUS default
$DT_{50,whole\ system}$ (d)	42.3 (maximum, n= 2)	1000	1000	Yes / EFSA, 2007 FOCUS default for metabolites
Maximum occurrence observed (% molar basis with respect to the parent)	-	Soil: 14.4 Total system: 19.3	Soil: 26.8 Total system: 11.1	Yes / EFSA, 2007

* Not required for Steps 1 & 2
[a] the K_{FOC} value named here was entered in the SWASH GUI. The corresponding K_{FOM} value given in the model input files is calculated internally by the model.
[b] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2007 and Graham & Strachan, 2008

Table 8.9-16: Input parameters related to nicosulfuron metabolites ADMP, UCSN and ASDM for $PEC_{SW/SED}$ calculations STEP 1/2 and 3/4

Compound	ADMP	UCSN	ASDM	Value in accordance to EU endpoint / Reference
Molar mass (g/mol)	155.2	315.3	229.2	Yes / EFSA, 2007
Water solubility (mg/L)	9500	9500	9500	Assumed same as parent value for metabolites
K_{FOC}[a] (mL/g)	51.1 (geometric mean, n = 4)	2.6 (geometric mean, n = 4)	2.3 (maximum, n = 4)	No[b] / EFSA, 2007 and Graham & Strachan, 2008
$DT_{50,soil}$ (d)	4.5 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n =3)	271.0 (maximum, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n =3)	236.6 (maximum, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n =3)	Yes / EFSA, 2007
$DT_{50,water}$ (d)	1000	1000	1000	FOCUS default
$DT_{50,sed}$ (d)	1000	1000	1000	FOCUS default
$DT_{50,whole\ system}$ (d)	1000	1000	1000	FOCUS default
Maximum occurrence observed (% molar basis with respect to the parent)	Soil: 7.2 Total system: 1×10^{-6}	Soil: 11 Total system: 6.5	Soil: 63.4 Total system: 9.4	Yes / EFSA, 2007

[a] the K_{FOC} value named here was entered in the SWASH GUI. The corresponding K_{FOM} value given in the model input files is calculated internally by the model.
[b] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2007 and Graham & Strachan, 2008

$PEC_{SW/SED}$

Table 8.9-17: FOCUS Step 1, 2 and 3 PEC_{SW} and PEC_{SED} for nicosulfuron following single application of 40 g a.s./ha to maize (refer to A 3.6 González Camarero, 2020a)

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	7 d- $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1	---	13.3	--	12.5	3.21
Step 2					
Northern Europe	March-May	1.98	--	1.90	0.462
Southern Europe	March-May	3.61	--	3.47	0.859
Step 3					
D3	ditch	0.217	Drift	0.043	0.038
D4	pond	0.025	Drainage	0.025	0.037
D4	stream	0.184	Drift	0.016	0.017
R1	pond	0.016	Runoff	0.016	0.013

Scenario FOCUS	Waterbody	Max PEC_{SW} (µg/L)	Dominant entry route	7 d- $PEC_{SW,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
R1	stream	0.449	Runoff	0.033	0.034

[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3

Table 8.9-18: **FOCUS Step 1, 2 and 3 PEC_{SW} and PEC_{SED} nicosulfuron following single application of 50 g a.s./ha to maize (refer to A 3.6 González Camarero, 2020a)**

Scenario FOCUS	Waterbody	Max PEC_{SW} (µg/L)	Dominant entry route	7 d- $PEC_{SW,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1	---	16.6	--	15.7	4.01
Step 2					
Northern Europe	March-May	2.47	--	2.37	0.578
Southern Europe	March-May	4.52	--	4.34	1.07
Step 3					
D3	ditch	0.272	Drift	0.054	0.048
D4	pond	0.032	Drainage	0.032	0.046
D4	stream	0.230	Drift	0.020	0.021
R1	pond	0.020	Runoff	0.019	0.016
R1	stream	0.561	Runoff	0.041	0.042

[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3

FOCUS Step 4

Table 8.9-19: **Global maximum PEC_{SW} values for nicosulfuron, following single application of either 40 g a.s./ha or 50 g a.s./ha to maize according to surface water Step 4 (refer to A 3.6 González Camarero, 2020a)**

			Mitigation options[a]					
		Vegetative strip (m)	5 [b]		10-12 [c]		18-20 [d]	
		No spray buffer (m)	5		10		20	
Use	Scenario	Water body	PEC_{SW} (µg/L)	Dominant route of entry	PEC_{SW} (µg/L)	Dominant route of entry	PEC_{SW} (µg/L)	Dominant route of entry
Maize 1 × 40 g a.s/ha BBCH 12-18	D3	ditch	0.076	Drift	0.044	Drift	0.026	Drift
	D4	pond	0.025	Drainage	0.025	Drainage	0.025	Drainage
	D4	stream	0.080	Drift	0.044	Drift	0.025	Drift
	R1	pond	0.012	Runoff	0.008	Runoff	0.005	Runoff
	R1	stream	0.274	Runoff	0.184	Runoff	0.093	Runoff
Maize 1 × 50 g	D3	ditch	0.095	Drift	0.055	Drift	0.033	Drift
	D4	pond	0.032	Drainage	0.032	Drainage	0.032	Drainage

			Mitigation options[a]					
		Vegetative strip (m)	**5 [b]**		**10-12 [c]**		**18-20 [d]**	
		No spray buffer (m)	**5**		**10**		**20**	
Use	**Scenario**	**Water body**	**PEC_{SW} (µg/L)**	**Dominant route of entry**	**PEC_{SW} (µg/L)**	**Dominant route of entry**	**PEC_{SW} (µg/L)**	**Dominant route of entry**
a.s/ha BBCH 12-18	D4	stream	0.100	Drift	0.055	Drift	0.031	Drift
	R1	pond	0.015	Runoff	0.010	Runoff	0.006	Runoff
	R1	stream	0.343	Runoff	0.230	Runoff	0.116	Runoff

[a] only relevant scenarios presented in table above, full set of scenarios available in Appendix 3
[b] equivalent to 40% runoff mitigation (EXPOSIT 3.0)
[c] equivalent to 60% runoff mitigation (FOCUS, 2007)
[d] equivalent to 80% runoff mitigation (FOCUS, 2007)

Table 8.9-20: FOCUS Step 4 Global Maximum PEC_{SW} nicosulfuron following single application to maize with the VFSmod module

Vegetative strip (m)			**Mitigation options**	
			5 [a]	
No spray buffer (m)			**-**	
Use	**Scenario**	**Water body**	**PEC_{SW} (µg/L)**	**Dominant route of entry**
Maize 1 × 40 g a.s/ha BBCH 12-18	R1	pond	0.008	Drift
	R1	stream	0.143	Drift
Maize 1 × 50 g a.s/ha BBCH 12-18	R1	pond	0.011	Drift
	R1	stream	0.178	Drift

[a] 5 m vegetated filter strip, simulated using VFSMod tool included in SWAN v 5.0.

Metabolite(s) of nicosulfuron

Table 8.9-21: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for HMUD following single application to maize

Use (g a.s./ha)	**Region**	**Season**	**Max PEC_{SW} (µg/L)**	**Max PEC_{SED} (µg/kg)[a]**
Maize 40 g a.s/ha	Step 1	---	4.39	0.171
	Step 2			
	Northern Europe	Mar-May	0.628	0.025
	Southern Europe	Mar-May	1.19	0.046
Maize 50 g a.s/ha	Step 1	---	5.48	0.214
	Step 2			
	Northern Europe	Mar-May	0.785	0.031

Use (g a.s./ha)	Region	Season	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)[a]
	Southern Europe	Mar-May	1.48	0.058

Table 8.9-22: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for AUSN following single application to maize

Use (g a.s./ha)	Region	Season	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)[a]
Maize 40 g a.s/ha	Step 1	---	3.84	0.498
	Step 2			
	Northern Europe	Mar-May	0.570	0.074
	Southern Europe	Mar-May	1.11	0.144
Maize 50 g a.s/ha	Step 1	---	4.79	0.623
	Step 2			
	Northern Europe	Mar-May	0.712	0.093
	Southern Europe	Mar-May	1.39	0.180

Table 8.9-23: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for ADMP following single application to maize

Use (g a.s./ha)	Region	Season	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)[a]
Maize 40 g a.s/ha	Step 1	---	0.340	0.174
	Step 2			
	Northern Europe	Mar-May	0.028	0.014
	Southern Europe	Mar-May	0.055	0.028
Maize 50 g a.s/ha	Step 1	---	0.425	0.217
	Step 2			
	Northern Europe	Mar-May	0.034	0.018
	Southern Europe	Mar-May	0.069	0.035

Table 8.9-24: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for UCSN following single application to maize

Use (g a.s./ha)	Region	Season	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)[a]
Maize 40 g a.s/ha	Step 1	---	1.80	0.047
	Step 2			
	Northern Europe	Mar-May	0.269	0.007
	Southern Europe	Mar-May	0.520	0.014
Maize 50 g a.s/ha	Step 1	---	2.26	0.059
	Step 2			

Use (g a.s./ha)	Region	Season	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)[a]
	Northern Europe	Mar-May	0.336	0.009
	Southern Europe	Mar-May	0.650	0.017

Table 8.9-25: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for ASDM following single application(s) to maize

Use (g a.s./ha)	Region	Season	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)[a]
Maize 40 g a.s/ha	Step 1	---	5.42	0.125
	Step 2			
	Northern Europe	Mar-May	0.805	0.019
	Southern Europe	Mar-May	1.59	0.037
Maize 50 g a.s/ha	Step 1	---	6.78	0.156
	Step 2			
	Northern Europe	Mar-May	1.01	0.023
	Southern Europe	Mar-May	1.99	0.046

8.9.2.3 Dicamba and its metabolite

The PEC_{SW} / PEC_{SED} modelling for dicamba and its metabolite DCSA (NOA414746) has not previously been reviewed.

Table 8.9-26: Input parameters related to active substance dicamba and DCSA for $PEC_{SW/SED}$ calculations STEP 1/2 and 3

Compound	Dicamba	DCSA	Value in accordance to EU endpoint / Reference
Molar mass (g/mol)	221	207	Yes / EFSA, 2011
Water solubility (mg/L)	6600 (25 °C)	88000 (25 °C)	Yes / EFSA, 2011
Saturated vapour pressure (Pa)	1.67×10^{-3} (25 °C)	-*	Yes / EFSA, 2011
Diffusion coefficient in water (m^2/d)	0.43	-*	FOCUS default
K_{FOC} (mL/g)	9.82 (geometric mean, n = 4)	877 (geometric mean, n = 5)	No[a] / EFSA, 2011
Freundlich Exponent 1/n	0.74 (arithmetic mean, n = 4)	-*	Yes / EFSA, 2011
Plant Uptake	0	-*	FOCUS default
Wash-Off factor from Crop (1/mm)	0.05 (MACRO) 0.50 (PRZM)	-*	FOCUS default
$DT_{50,soil}$ (d)	4.0 (geometric mean, laboratory,	9.4 (geometric mean, laboratory,	Yes / EFSA, 2011

Compound	Dicamba	DCSA	Value in accordance to EU endpoint / Reference
	normalisation to pF2, 20 °C with Q_{10} of 2.58, n = 5)	normalisation to pF2, 20 °C with Q_{10} of 2.58, n = 5)	
$DT_{50,water}$ (d)	1000*	57.9 (geometric mean, n = 2)	*FOCUS default Yes / EFSA, 2011
$DT_{50,sed}$ (d)	1000*	57.9 (geometric mean, n = 2	*FOCUS default Yes / EFSA, 2011
$DT_{50,whole\ system}$ (d)	41.0 (geometric mean, n = 2)	57.9 (geometric mean, n = 2)	Yes / EFSA, 2011
Maximum occurrence observed (% molar basis with respect to the parent)	-	Soil: 58.8 Total system: 31.4	Yes / EFSA, 2011

* Not required for Steps 1 & 2
[a] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2011

$PEC_{SW/SED}$

Table 8.9-27: FOCUS Step 1, 2 and 3 PEC_{SW} and PEC_{SED} for dicambar following single application of 160 g a.s./ha to maize

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	7 d- $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1	---	54.1	--		5.31
Step 2					
Northern Europe	March-May	5.40	--		0.530
Southern Europe	March-May	9.35	--		0.917
Step 3[a]					
D3	ditch	0.840	Drift	0.048	0.137
D4	pond	0.034	Drift	0.031	0.073
D4	stream	0.719	Drift	0.003	0.031
R1	pond	0.047	Runoff	0.043	0.090
R1	stream	1.47	Runoff	0.032	0.136

[a] only relevant scenarios presented in table above full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document

Table 8.9-28: FOCUS Step 1, 2 and 3 PEC_{SW} and PEC_{SED} for dicamba following single application of 200 g a.s./ha to maize

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	7 d- $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1	---	67.6	--		6.64
Step 2					
Northern Europe	March-May	6.75	--		0.662
Southern Europe	March-May	11.7	--		1.15
Step 3 [a]					
D3	ditch	1.05	Drift	0.061	0.167
D4	pond	0.042	Drift	0.039	0.089
D4	stream	0.899	Drift	0.004	0.039
R1	pond	0.058	Runoff	0.053	0.109
R1	stream	1.83	Runoff	0.039	0.166

[a] only relevant scenarios presented in table above full set of scenarios upon request because the reports in Appendix 3 have not been updated in this version of the document

Metabolite(s) of dicamba

Table 8.9-29: FOCUS Step 1 and 2 PEC_{SW} and PEC_{SED} for DCSA following single application(s) to maize

Use (g a.s./ha)	Region	Season	Max PEC_{SW} (µg/L)	Max PEC_{SED} (µg/kg)[a]
Maize 160 g a.s/ha	Step 1	---	21.2	182
	Step 2			
	Northern Europe	Mar-May	2.29	19.5
	Southern Europe	Mar-May	4.34	37.4
Maize 200 g a.s/ha	Step 1	---	26.5	228
	Step 2			
	Northern Europe	Mar-May	2.86	24.3
	Southern Europe	Mar-May	5.43	46.7

8.9.2.4 $PEC_{SW/SED}$ of A18385B

PEC_{SW} for the formulation was calculated for drift only, based on the percentage drift data from Rautmann (2004)[13]. The formulation components are considered to dissipate rapidly after application, therefore only one application and drift entry are taken into consideration.

The initial PEC_{SW} for a single application is calculated as follows:

[13] D. Rautmann, M. Streloke, M. Winkler (2001): New basic drift values in the authorisation procedure for plant protection products. In: R. Forster, M. Streloke: Workshop on Risk Assessment and Risk Mitigation Measures in the Context of the Authorization of Plant Protection Products (WORMM). Mitt. Biol. Bundesanst. Land-Forstwirtsch, Berlin-Dahlem, Heft 381.

$$PEC_{SW}\ (\mu g/L) = \frac{\%\ \text{drift} \times \text{application rate (g/ha)}}{\text{water depth (30 cm)} \times 10}$$

Table 8.9-30: Initial PEC_{SW} for A18385B following single/ spray application to maize

Formulation	Crop	Number of applications	Maximum use rate (g A18385B /ha)	Drift[a] (distance from crop)	Drift reducing nozzle (%)	PEC_{SW} (µg A18385B /L)
A18385B	Field crops	1	500	2.77% (1 m)	-	4.62
					50	2.31
					75	1.15
					90	0.462
				0.57 (5 m)	-	0.950
					50	0.475
					75	0.238
					90	0.095

[a] Drift value according to Rautmann at al. (2001)

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

8.10.1 Prosulfuron

The fate and behaviour of prosulfuron in air is considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of prosulfuron (Prosulfuron, EFSA Journal 2014; 12(9): 3815; Prosulfuron, EFSA Journal 2020;18(7):6181).

Table 8.10-1 Summary of atmospheric degradation and behaviour

Compound	Prosulfuron
Direct photolysis in air	No data – not required
Quantum yield of direct phototransformation	No data – not required
Photochemical oxidative degradation in air	DT_{50}: 4.7 - 46 hours derived by the Atkinson model OH (12h) concentration assumed = 1.5 $\times 10^6$ OH radicals/cm^3
Volatilisation	Vapour pressure (Pa): < 3.5 $\times$ 10^{-6} (25°C, 99.5 % purity) Henry's Law Constant (Pa.m^3/mol): 3 $\times$ 10^{-4}
Metabolites	No data – not required

The vapour pressure at 25 °C of the active substance prosulfuron is < 10^{-5} Pa. Hence the active substance prosulfuron is regarded as non-volatile. Therefore exposure of adjacent surface waters and terrestrial ecosystems by the active substance prosulfuron due to volatilization with subsequent deposition should not be considered.

8.10.2 Nicosulfuron

The fate and behaviour of nicosulfuron in air are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of nicosulfuron (Nicosulfuron, EFSA Scientific Report (2007) 120, 1-91).

Table 8.10-2 Summary of atmospheric degradation and behaviour

Compound	Nicosulfuron
Direct photolysis in air	No data – not required
Quantum yield of direct phototransformation	No data – not required
Photochemical oxidative degradation in air	DT_{50}: 0.587 hours derived by the Atkinson model OH (12h) concentration assumed = 1.5 $\times 10^6$ OH radicals/cm^3
Volatilisation	Vapour pressure (Pa): <8 $\times 10^{-10}$ (25°C) Henry's Law Constant (Pa.m^3/mol): 1.48 $\times 10^{-11}$
Metabolites	No data – not required

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

8.10.3 Dicamba

The fate and behaviour of dicamba in air are considered to be data provided in support of the active substance. All relevant detailed experimental information has been submitted for EU review of dicamba (Dicamba, EFSA Journal 2011;9(1):1965).

Table 8.10-3 Summary of atmospheric degradation and behaviour

Compound	Dicamba
Direct photolysis in air	No data – not required
Quantum yield of direct phototransformation	No data – not required
Photochemical oxidative degradation in air	DT_{50} (d): 3.6 derived by the Atkinson model OH (12h) concentration assumed = 1.5×10^{6} OH × cm^{-3}
Volatilisation	Vapour pressure (Pa): 1.67×10^{-3} at 25°C Henry's Law Constant ($Pa.m^3/mol$): 1.0×10^{-4} at 25°C
Metabolites	No data – not required

Table 8.10-4 PEC_{AIR} *via* volatilisation and drift

Deposition:	**PEC (*via* Volatilisation)**		**PEC terra (*via* Volatilisation and Drift)**		
1 application for V considered !		**V**	**D**	**D**	**V + D**
Distance (m)	% V	g/ha	%	g/ha	g/ha
0			100	200	200
1	0.21	0.41	2.77	5.54	5.95
3	0.18	0.37	-		
5	0.17	0.33	0.57	1.14	1.47

The potential for volatilisation of dicamba has been investigated wherein the evaporation of dicamba from freshly treated soil and plant surfaces was investigated in two studies using model chambers. In both studies, volatilisation was negligible after 24 hours of monitoring with a maximum percentage of 1.15% and 0.12% of AR evaporated from soil and leaf surfaces, respectively. The vapour pressure value of 1.67×10^{-3} Pa (25°C) shows medium risk for volatilisation from plant surfaces.

The small proportion of dicamba that may be lost to the upper atmosphere is expected to degrade relatively quickly. The estimated atmospheric degradation half-life of dicamba by OH-radicals is 3.6 days (AOP, ver. 1.85 based on the Atkinson model (assuming an OH-radical (12 h) concentration of 1.5×10^{6} OH/cm^{3}).

Although this estimated half-life in air is greater than 2 days, there are various considerations to take into account which clearly indicate that under real-use conditions, dicamba is unlikely to be subject to long range aerial transport in any environmentally relevant amounts. It must be kept in mind that the DT_{50} in air of 2 days is only used as an initial screen or trigger to determine whether a pesticide has a *potential* for long range transport. The high water solubility of dicamba indicates that particles will be more efficiently scavenged by rain and will travel much shorter distances than the 'half distance' of 864 km proposed by the FOCUS Air Group[14]. As already stated, the amount of dicamba potentially transferred into the air is estimated to be very low (based on experimentally derived data) and subsequent transport and deposition

[14] The distance a substance could theoretically travel through the atmosphere in two days; see.FOCUS (2008): “Pesticides in Air: Considerations for Exposure Assessment”. Report of the FOCUS Working Group on Pesticides in Air, EC Document Reference SANCO/10553/2006 Rev 2 June 2008. 327pp

(and degradation) in air, which must be expected to result in a broad diffusion over wide areas, will lead to further 'dilution' and reduction in concentrations. These facts combined with the experimentally derived degradation data available for soil and water/sediment environments indicate that any amounts of dicamba undergoing long-range transport and subsequent deposition at distances from the source will undergo subsequent breakdown. An accumulation in any relevant amounts is not expected and must be considered as highly unlikely. Moreover, no unacceptable ecotoxicological impact of dicamba in areas directly adjacent to or in treated areas has been demonstrated in appropriate risk assessments (please refer to the Part B, Section 6 document submitted in conjunction with this document as part of the overall dossier submission). The concentrations of dicamba used in these risk assessments are many times higher than any concentrations that can be expected to occur following potential long-range transport *via* air.

For these reasons, although dicamba may have the potential for long-range transport through the atmosphere, no environmentally relevant impact or risk is considered to be realistically likely to occur and the presented data are deemed sufficient for this Annex point in the registration of A18385B.

Appendix 1 Lists of data considered in support of the evaluation

List of data submitted by the applicant and relied on

Data point	Author(s)	Year	Title Company Report No Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
Prosulfuron					
KCP 9.1.1.1 / 01	Patel, M.	2014	Prosulfuron – Laboratory Degradation Kinetics for Modelling Endpoints for the soil metabolite SYN547308. Syngenta Ltd, Jealott's Hill International Research Centre, Bracknell, Berkshire, RG42 6EY, United Kingdom. Report No RAJ1065B. Non GLP Unpublished, Syngenta File No SYN547308_10009; VV-628381	N	Syngenta
KCP 9.1.1.2.1 / 01	Hardy, I.A.J. and Jastrzebski, N.D.	2016	Prosulfuron - Kinetic Modelling Evaluation of Data from Field Soil Dissipation Studies for Trigger Endpoints. Batelle UK Ltd., Essex, UK. Report No: NC/15/041B. Non GLP Unpublished, Syngenta File No CGA152005_10793; VV-629450	N	Syngenta
KCP 9.1.1.2.1 / 02	Hardy, I.A.J. and Jastrzebski, N.D.	2016a	Prosulfuron - Kinetic Modelling Evaluation of Data from Field Soil Dissipation Studies Normalised to 20ºC (Q_{10} 2.58). Batelle UK Ltd., Essex, UK. Report Number: NC/15/041A. Non GLP Unpublished, Syngenta File No CGA152005_10792; VV-629449	N	Syngenta
KCP 9.1.2 / 01	Crabtree, G.	2014	SYN547308 - Adsorption and Desorption Properties of 14C-SYN547308, a Metabolite of Prosulfuron. Smithers Viscient (ESG) Ltd., Otley Road, Harrogate, North Yorkshire HG3 1PY, UK. Report No 3200461. Non GLP Unpublished, Syngenta File No SYN547308_10010; VV-409563	N	Syngenta
KCP 9.2.4 / 01	De Vries, K.	2016	Prosulfuron - A Leaching Assessment for Parent and Soil Metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707, CGA325025 and SYN547308 Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Various Crops in the EU Dr. Knoell Consult GmbH, Mannheim, Germany, Report Number 103276-2.	N	Syngenta

Data point	Author(s)	Year	**Title** **Company Report No** **Source (where different from company)** **GLP or GEP status** **Published or not**	Vertebrate study Y/N	Owner
			Non GLP Unpublished, Syngenta File No CGA152005_10795; VV-629994 **This is CONFIDENTIAL INFORMATION – refer to Part C**		
KCP 9.2.5 / 01	De Vries, K.	2016a	Prosulfuron - A European Environmental Fate Assessment for Parent Using the FOCUS Surface Water Models at Steps 3 to 4 Following Spray Application to Maize and Cereals in the EU. Dr. Knoell Consult GmbH, Mannheim, Germany, Report No 103276-1. Non GLP Unpublished, Syngenta File No CGA152005_10806; VV-630378 **This is CONFIDENTIAL INFORMATION – refer to Part C**	N	Syngenta
Nicosulfuron					
KCP 9.2.4	González Camarero, P.	2020	Nicosulfuron - A Leaching Assessment for Parent and Metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466 Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Maize knoell Germany GmbH, Mannheim, Germany, Report No 113644-2 Non GLP Unpublished, Syngenta File No VV-877107 **This is CONFIDENTIAL INFORMATION – refer to Part C**	N	Syngenta
KCP 9.2.5	González Camarero, P.	2020a	Nicosulfuron - A European Environmental Fate Assessment for Nicosulfuron Using the FOCUS Surface Water Models at Steps 3 to 4 Following Spray Application to Maize knoell Germany GmbH, Mannheim, Germany, Report No 113644-3 Non GLP Unpublished, Syngenta File No VV-877111 **This is CONFIDENTIAL INFORMATION – refer to Part C**	N	Syngenta
Dicamba					
KCP 9.2.4	González Camarero, P.	2020b	Dicamba - A Leaching Assessment for Parent and Metabolite DSCA. Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Maize, knoell Germany GmbH, Mannheim, Germany, Report No 113644-1	N	Syngenta

Data point	Author(s)	Year	Title Company Report No Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
			Non GLP Unpublished, Syngenta File No VV-877105 **This is CONFIDENTIAL INFORMATION – refer to Part C**		

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

Data point	Author(s)	Year	Title Company Report No Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
Prosulfuron					
KCP 9.1.1	Atkins, R.H.	1993	Aerobic Metabolism of Phenyl-14C-CGA-152005 in Sandy Loam Soil Novartis Crop Protection AG, Basel, Switzerland Not Known, PTRL 583 GLP, not published Syngenta File No CGA152005/0189	N	Syngenta
KCP 9.1.1	Atkins, R.H.	1993a	Aerobic Metabolism of Triazine 14C-CGA-152005 in Sandy Loam Soil Novartis Crop Protection AG, Basel, Switzerland Not Known, PTRL NO 585 GLP, not published Syngenta File No CGA152005/0183	N	Syngenta
KCP 9.1.1	Atkins, R.H.	1994	Aerobic Metabolism of Triazine-14C-CGA-152005 in Soil at Approximately pH 6 Novartis Crop Protection AG, Basel, Switzerland Not Known, 636	N	Syngenta

Data point	Author(s)	Year	Title Company Report No Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
			GLP, not published Syngenta File No CGA152005/0399		
KCP 9.1.1	Atkins, R.H.	1994a	Aerobic Metabolism of Phenyl-14C-CGA-152005 in Soil at Approximately pH 6 Novartis Crop Protection AG, Basel, Switzerland PTRL East, Inc., Richmond, USA, 635 GLP, not published Syngenta File No CGA152005/0471	N	Syngenta
KCP 9.1.1	Fahrbach, M.	2011	[14C]-Prosulfuron - Aerobic Soil Metabolism Study (Rate) in Four Soils Incubated at 20 °C Harlan Laboratories Ltd., Itingen, Switzerland, C95314 GLP, not published Syngenta File No CGA152005_10603	N	Syngenta
KCP 9.1.1	Hurt, A., Mason, G., Hamlet, J.	2011	PROSULFURON - Rate of Degradation of Soil Metabolites CGA325025 and SYN524604 in Three Soils, under Laboratory Conditions Syngenta Crop Protection AG, Basel, Switzerland Syngenta - Jealott’s Hill International, Bracknell, Berkshire, United Kingdom, T001216-06-REG GLP, not published Syngenta File No CGA325025/0004	N	Syngenta
KCP 9.1.1	Jungmann, V., Nicollier, G.	2006	Rate of Degradation of [triazinyl-6-14C]-labelled CGA150829 (Metabolite of CGA152005) in Various Soils under Aerobic Laboratory Conditions at 20 °C Syngenta Crop Protection AG, Basel, Switzerland Syngenta Crop Protection AG, Basel, Switzerland, T001214-06 GLP, not published Syngenta File No CGA150829/0027	N	Syngenta
KCP 9.1.1	Kuet, S.	2006	Prosulfuron - Rate of Degradation of Soil Metabolite CGA349707 in Three Soils, under Laboratory Conditions	N	Syngenta

Data point	Author(s)	Year	Title Company Report No Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
			Syngenta Crop Protection AG, Basel, Switzerland Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, T001218-06-REG GLP, not published Syngenta File No CGA349707/0014		
KCP 9.1.1	Nicollier, G., Berdat, T.	2006	Rate of Degradation of [phenyl-U-14C]-labelled CGA159902 (Metabolite of CGA152005) in Various Soils under Aerobic Laboratory Conditions at 20°C Syngenta Crop Protection AG, Basel, Switzerland Syngenta Crop Protection AG, Basel, Switzerland, T001215-06 GLP, not published Syngenta File No CGA159902/0020	N	Syngenta
KCP 9.1.1	Reischmann, F.J.	1994	Degradation of CGA 152005 in Four Soils under Aerobic Laboratory Conditions at 20°C Novartis Crop Protection AG, Basel, Switzerland Ciba-Geigy Ltd., Basel, Switzerland, PR 21/93 (92RF05-1 AND 92RF05-2) GLP, not published Syngenta File No CGA152005/0200	N	Syngenta
KCP 9.1.1	Reischmann, F.J.	1994a	Influence of Soil Biomass on the Degradation Half-Life of CGA 152005 Novartis Crop Protection AG, Basel, Switzerland Ciba-Geigy Ltd., Basel, Switzerland, PR 19/94 GLP, not published Syngenta File No CGA152005/0400	N	Syngenta
KCP 9.1.2	Reischmann, F.J.	1993	Leaching model study with CGA 152005 in four soils under laboratory conditions Novartis Crop Protection AG, Basel, Switzerland Ciba-Geigy Ltd., Basel, Switzerland, 92RF10 6/93 GLP, not published Syngenta File No CGA152005/0212	N	Syngenta

Data point	Author(s)	Year	Title Company Report No Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 9.1.1	Reischmann, F.J.	1994	Degradation of CGA 152005 in Four Soils under Aerobic Laboratory Conditions at 20°C Novartis Crop Protection AG, Basel, Switzerland Ciba-Geigy Ltd., Basel, Switzerland, PR 21/93 (92RF05-1 AND 92RF05-2) GLP, not published Syngenta File No CGA152005/0200	N	Syngenta
KCP 9.1.2.1	Kesterson, A.	1992	Column Leaching of [14C] triazine CGA 152005 in four soil types Novartis Crop Protection AG, Basel, Switzerland PTRL West Inc., Richmond CA, USA, 533 GLP, not published Syngenta File No CGA152005/0111	N	Syngenta
KCP 9.1.2.2	Burgener, A.	1996	Mobility and degradation in soil in oudoor lysimeters Syngenta Crop Protection AG, Basel, Switzerland RCC Ltd., Itingen, Switzerland, RCC 321570 GLP, not published Syngenta File No CGA152005/0806	N	Syngenta
KCP 9.2.2	Eatherall, A.	2004	Prosulfuron (CGA 152005): Summary of Whole-System Half-life Data in Water-Sediment Studies Syngenta Crop Protection AG, Basel, Switzerland Syngenta - Jealott's Hill, Bracknell, United Kingdom, RAJ0273B GLP, not published Syngenta File No CGA152005/0797	N	Syngenta
KCP 9.2.4.1	Comoretto, L.	2007	Prosulfuron (CGA152005) - Leaching Behaviour of Prosulfuron and Six Metabolites (CGA150829, CGA159902, CGA300406, CGA325025, SYN542604 and CGA349707) using the FOCUS-PELMO Groundwater Scenarios Following Application to Maize at 20 g ha^{-1} Syngenta Crop Protection AG, Basel, Switzerland Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, RAJ0568B	N	Syngenta

Data point	Author(s)	Year	Title Company Report No Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
			Not GLP, not published Syngenta File No CGA152005/0904		
KCP 9.2.4.1	Patterson, D.	2013	Use of prosulfuron soil degradation DegT50 of 18.1d in a leaching assessment using the FOCUS PEARL 4.4.4 groundwater scenarios following use on maize crops. Syngenta, Jealott's Hill International Research Centre, Bracknell, Berkshire, RG42 6EY, UK. Unpublished statement, Syngenta File No CGA152005_10669	N	Syngenta
KCP 9.3.1	Reischmann, F.J.	1992	Volatilization of CGA 152005 from soil surface under controlled laboratory conditions Novartis Crop Protection AG, Basel, Switzerland Ciba-Geigy Ltd., Basel, Switzerland, 18-92 GLP, not published Syngenta File No CGA152005/0092	N	Syngenta
Nicosulfuron					
	Derz, K.	2013	[^{14}C]-Nicosulfuron: Uptake and Translocation in Wheat and Tomato from Hydroponic System Fraunhofer IME Germany, Report No SYN-013/7-63. GLP, not published Syngenta File No ASF628_11206	N	Syngenta
KCP 9.1.2	Graham R., Strachan K.	2008	[^{14}C] Nicosulfuron: Adsorption/Desorption in Soil Covance Laboratories Ltd, Harrogate North Yorkshire, UK., Report No 79 NIS Cheminova A/S GLP, not published Syngenta File No ASF628_11275	N	Cheminova A/S

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

Appendix 2 Detailed evaluation of the new Annex II studies

A 2.1 Patel, M (2014): Prosulfuron – Laboratory Degradation Kinetics for Modelling Endpoints for the soil metabolite SYN547308

Comments of zRMS:	The submitted report was not evaluated. This report was evaluated during active substance renewal.

Reference:	KCP 9.1.1.1 / 01
Report	Prosulfuron – Laboratory Degradation Kinetics for Modelling Endpoints for the soil metabolite SYN547308, Patel, M (2014), Syngenta Ltd, Jealott's Hill International Research Centre, Bracknell, Berkshire, RG42 6EY, United Kingdom. Report No RAJ1065B. (Syngenta file No SYN547308_10009; VV-628381).
Guideline(s):	Yes: FOCUS (2006) "Guidance Document on Estimating Persistence and Degradation Kinetics from Environmental Fate Studies on Pesticides in EU Registration" Report of the FOCUS Work Group on Degradation Kinetics, EC Document Reference SANCO/10058/2005 version 2.0, 434 pp.
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

A 2.1.1 Executive Summary

This report presents the calculations of $DegT_{50}$ and $DegT_{90}$ values for SYN547308 (also known as M18, a soil metabolite of prosulfuron) for modelling endpoints.

The rate of degradation of SYN547308 has been studied in the laboratory in one study on three soils; Vetroz (loam), 18 Acres (sandy clay loam) and Krone (silt loam), (Gilbert, 2014).

The original data from this study was used to calculate the rate of degradation of SYN547308 in soil, following the guidance in FOCUS Kinetics (2006).

Modelling

Kinetic modelling following the appropriate FOCUS Kinetics (2006) flowchart was carried out using CAKE v2.0 (2013).

Confidence in the resulting parameters has been assessed visually and from the confidence intervals for the α and β parameters of the first order multi compartment (FOMC) model or probability values for a t-test of the rate parameters for the single first order (SFO), dual first order in parallel (DFOP) and hockey stick (HS) models. Where the parameters for a particular model are not significantly different from zero at the 95th or 90th significance level, it has been concluded that the model is not appropriate to represent the degradation behaviour of SYN547308 in that soil. The $\chi 2$ error% parameter has been used to determine goodness of fit and where two models are an appropriate to fit the data, the choice of best fit has been based on the lowest value of this parameter.

Data manipulation

The M0 values for each soil were set to the recovered amount multiplied by the radiochemical purity.

Normalisation to 20ºC and pF2

As the study was conducted at 20ºC and moisture adjusted to 10 kPa, no normalisation of $DegT_{50}$ values was required.

A 2.1.2 Results

Table A 1 summarises the kinetic analyses and average across soil types for modelling endpoints for SYN547308. **Table A 2** to **Table A 4** summarise the kinetic fits and decisions made following the steps in the flowcharts of the FOCUS (2006) guidance to generate endpoints for SYN547308.

Table A 1: Modelling DegT50 values for SYN547308 in laboratory aerobic soil

Soil	Modelling #		Reference
	$DegT_{50}$ (days)	Kinetic Model	
Vetroz	207	SFO	Gilbert, 2014
18 Acres	36.4	DFOP	Gilbert, 2014
Krone	40.1	SFO	Gilbert, 2014
Geometric mean (3 soils)	67.1		

All values at pF2 and 20°C

Table A 2: Modelling endpoints for SYN547308 – Vetroz (loam, Gilbert, 2014)

Soil (ref)	Vetroz (loam, Gilbert, 2014)	
Model	SFO	DFOP
Visual Fit	Acceptable	Good
Residuals (visual)	Acceptable	Good
χ^2 error (%)	2.83	1.18
Initial value: Estimate (% of applied) / (range) / standard error	P_{ini}: 90 (95.1 – 96.1) σ: 1.166	P_{ini}: 95.2 (95.1 - 100) σ: 1.063
Rate Parameters: estimate / standard error / probability (trigger: 0.05)	kP: 0.0041 σ: 0.000334 $p < 0.01$	k_1: 0.2126 σ: 0.07536 $p < 0.01$
		k_2: 0.003355 σ: 0.000239 $p < 0.01$
		g: 0.1041 σ: 0.01637
DT_{50} (days)	163	174
DT_{90} (days)	562	654
Modelling DT_{50} (days)[a]	169	207
Adjusted for 20°C and pF2 (days)	169	207
FOCUS decision step	10% not	DFOP better and

	reached – Try DFOP	more robust than SFO – Use DFOP k2

[a] DT_{50} if SFO, DT_{90}/3.32 if 10% reached during study, otherwise ln(2)/k_2

Table A 3: Modelling endpoints for SYN547308 – 18 Acres (sandy clay loam, Gilbert, 2014)

Soil (ref)	18 Acres (sandy clay loam, Gilbert, 2014)	
Model	SFO	FOMC
Visual Fit	Acceptable	Good
Residuals (visual)	Acceptable	Good
χ^2 error (%)	7.31	3.77
Initial value: Estimate (% of applied) / (range) / standard error	P_{ini}: 88.5 (95 - 97.2) σ: 2.53	P_{ini}: 93.5 (95 - 100) σ: 1.737
Rate Parameters: estimate / standard error / probability (trigger: 0.05)	kP: 0.03094 σ: 0.002722 $p < 0.01$	α: 1.32 σ: 0.2395 CI does not contain 0
		β: 25.53 σ: 7.013 CI does not contain 0
DT_{50} (days)	22.4	17.6
DT_{90} (days)	74.4	120
Modelling DT_{50} (days)[a]	22.4	36.4
Adjusted for 20°C and pF2 (days)	22.4	36.4
FOCUS decision step	10% reached – Try FOMC	FOMC better than SFO and robust – Use FOMC (DT_{90}/ 3.32)

[a] DT_{50} if SFO, DT_{90}/3.32 if 10% reached during study, otherwise ln(2)/k_2

Table A 4: Modelling endpoints for SYN547308 – Krone (silt loam, Gilbert, 2014)

Soil (ref)	Krone (silt loam, Gilbert, 2014)	
Model	SFO	FOMC
Visual Fit	Poor	Good
Residuals (visual)	Poor	Good
χ^2 error (%)	16.10	2.40
Initial value: Estimate (% of applied) / (range) / standard error	P_{ini}: 87.6 (98.7 - 100) σ: 5.4	P_{ini}: 99.2 (98.7 - 100) σ: 1.209
Rate Parameters: estimate / standard error / probability (trigger: 0.05)	kP: 0.05218 σ: 0.009175	α: 0.6593 σ: 0.03834

	$p < 0.01$	CI does not contain 0
		β: 4.186 σ: 0.5029 CI does not contain 0
DT_{50} (days)	13.3	7.79
DT_{90} (days)	44.1	133
Modelling DT_{50} (days)[a]	13.3	40.1
Adjusted for 20°C and pF2 (days)	13.3	40.1
FOCUS decision step	10% reached – Try FOMC	FOMC better than SFO – Use FOMC (DT_{90}/ 3.32)

[a] DT_{50} if SFO, DT_{90}/3.32 if 10% reached during study, otherwise $\ln(2)/k_2$

A 2.2 Hardy, IAJ and Jastrzebski, ND (2016): Prosulfuron - Kinetic Modelling Evaluation of Data from Field Soil Dissipation Studies for Trigger Endpoints

Comments of zRMS:	The submitted report was not evaluated. This report was evaluated during active substance renewal.

Reference: KCP 9.1.1.2.1 / 01

Report: Prosulfuron - Kinetic Modelling Evaluation of Data from Field Soil Dissipation Studies for Trigger Endpoints. Hardy, IAJ and Jastrzebski, ND (2016), Batelle UK Ltd., Essex, UK. Report No: NC/15/041B, (Syngenta File No CGA152005_10793; VV-629450).

Guideline(s): Yes:
FOCUS (2006): Guidance document on estimating persistence and degradation kinetics from environmental fate studies on pesticides in EU registration. Report of the FOCUS Work Group on Degradation Kinetics, EC Document Reference Sanco/10058/2005, version 2.0, 434 pp.

Deviations: No

GLP: Not applicable

Acceptability: Yes/No/Supplementary

A 2.2.1 Materials and methods

The aim of this evaluation was to conduct a kinetic modelling analysis for prosulfuron from field soil dissipation studies in order to derive un-normalised field DT_{50} values for use in subsequent exposure assessments.

In the original data for the Spanish trial, erroneous core diameters were given. This reissued report takes account of the recalculated residue data for this trial resulting from that change in core diameter.

Field soil dissipation studies with prosulfuron have been conducted at six trial sites located in Denmark, France, Germany, Spain and the United Kingdom [Gezahegne (a-f)]. Table A 5 summarises the locations and trial information for the test sites.

Table A 5: Trial information

Location	Reference	Region / Country	Trial type	Application date
Bogense (DK)	Gezahegne (a)	Denmark	Bare soil with sand coverage	1/7/14
Castelsarrasin (FR1)	Gezahegne (b)	France	Bare soil with sand coverage	30/6/14
St. Cyprien (FR2)	Gezahegne (c)	France	Bare soil with sand coverage	23/6/14
Breitenwisch (DE)	Gezahegne (d)	Germany	Bare soil with sand coverage	30/6/14
Canals (ES)	Gezahegne (e)	Spain	Bare soil with sand coverage	23/6/14
Wilson (UK)	Gezahegne (f)	United Kingdom	Bare soil with sand coverage	25/6/14

Spray applications of the active substance at nominal rates of 20 g a.i. ha^{-1} were made. For all studies, soil samples from depths of 0-100 cm were collected at regular intervals for up to 365 days after application, although it was only necessary to analyse samples through to intervals of 91-184 days after application. No residues were detected in the deepest analysed horizons at any time point. The reported residue data for the trials is summarised in Table A 6.

Table A 6: Summary of reported prosulfuron residue data

Begonse (DK)		Castelsarrasin (FR1)		St. Cyprien (FR2)	
Time (days)	**PSF (g ai/ha)**	**Time (days)**	**PSF (g ai/ha)**	**Time (days)**	**PSF (g ai/ha)**
0	23.4	0	10.6	0	14.4
0	19.8	0	10.9	0	11.0
0	23.8	0	11.9	0	10.0
1	13.2	1	11.2	1	14.4
1	12.4	1	8.3	1	12.6
1	13.3	1	3.9	1	9.1
3	13.1	3	12.7	3	6.9
3	12.0	3	5.7	3	14.9
3	14.8	3	6.9	3	10.2
7	9.3	7	9.7	7	5.9
7	9.2	7	6.6	7	11.5
7	8.9	7	5.9	7	8.4
15	8.1	15	4.1	14	3.8

15	5.5	15	3.3	14	12.3
15	8.1	15	5.0	14	3.7
17	7.5	21	2.2	22	6.4
17	7.5	21	1.9	22	3.7
17	8.2	21	2.8	22	5.6
21	6.5	28	2.1	28	4.9
21	5.3	28	1.5	28	4.3
21	7.7	28	1.6	28	5.4
28	4.0	58	0.5	57	2.3
28	5.3	58	0.6	57	5.4
28	5.7	58	0.6	57	5.5
58	3.3	93	0.7	87	1.4
58	2.5	93	0.2	87	2.9
58	3.6	93	0.7	87	2.7
93	1.3	-	-	113	1.4
93	1.3	-	-	113	1.7
93	2.3	-	-	113	2.1
-	-	-	-	175	0.5
-	-	-	-	175	0.5
-	-	-	-	175	0.8
Breitenwisch (DE)		**Canals (ES)**		**Wilson (UK)**	
Time (days)	**PSF (g ai/ha)**	**Time (days)**	**PSF (g ai/ha)**	**Time (days)**	**PSF (g ai/ha)**
0	15.5	0	19.5	0	14.6
0	15.1	0	13.3	0	12.0
0	14.0	0	19.4	0	10.0
1	14.4	1	17.5	1	13.2
1	16.9	1	19.9	1	12.6
1	21.2	1	13.2	1	10.3
3	15.2	3	14.1	3	14.0
3	13.5	3	10.8	3	17.0
3	12.1	3	15.4	3	15.1
7	13.0	7	9.1	7	8.2
7	10.6	7	9.3	7	11.7
7	11.2	7	16.0	7	8.8
15	4.3	14	11.1	13	7.6
15	3.2	14	8.5	13	8.1
15	3.3	14	11.2	13	6.1
21	3.0	21	11.1	21	1.7

21	3.3	21	8.8	21	2.9
21	3.7	21	9.2	21	2.9
30	1.7	29	7.9	28	3.2
30	1.3	29	6.4	28	2.3
30	1.6	29	8.8	28	2.1
59	0.6	58	3.9	57	1.6
59	0.6	58	1.9	57	1.5
59	0.5	58	2.2	57	1.6
-	-	91	3.0	91	1.2
-	-	91	2.4	91	0.8
-	-	91	2.5	91	0.7
-	-	116	2.1	-	-
-	-	116	1.2	-	-
-	-	116	1.7	-	-
-	-	184	0.1	-	-
-	-	184	0.1	-	-
-	-	184	0.1	-	-

A 2.2.2 Results and discussions

Prosulfuron was evaluated according to the FOCUS flowchart for the determination of parent trigger endpoint field DT_{50} values (FOCUS, 2006).

The prosulfuron degradation data Table A 6 were entered into the CAKE 3.1 scheme. Optimisations with SFO kinetics showed both visually and statistically acceptable fits to the FR1, DE, ES and UK trials. Optimisation with DFOP kinetics showed a visually and statistically acceptable fit to the DK and FR2 trials.

The aim of this evaluation was to conduct a kinetic modelling analysis of prosulfuron data from field soil degradation studies in order to derive unnormalised trigger endpoint DT_{50} values for use in subsequent exposure assessments Table A 7 and Table A 8.

All datasets were evaluated against FOCUS Kinetics criteria based on visual assessment, minimum chi^2 error of <25% and t-test parameter significance >=95%. FOCUS Kinetics does not quote an acceptable minimum chi^2 error for field data, merely stating that it will be higher than laboratory data due to the inherent variability. A value of 25% has been taken as a realistic value. As with laboratory data, values above this may still be acceptable based on further expert assessment of the data.

Kinetic modelling analysis of the data from prosulfuron field soil dissipation studies showed good model fits for all of the trials.

Table A 7: Summary of trigger endpoint DT_{50} values for prosulfuron

Trial	Best-fit kinetic	DT_{50} (days)	DT_{90} (days)
Bogense (DK)	DFOP	4.6	55.8
Castelsarrasin (FR1)	SFO	11.4	38.0

Trial	Best-fit kinetic	DT_{50} (days)	DT_{90} (days)
St. Cyprien (FR2)	DFOP	17.4	150
Breitenwisch (DE)	SFO	9.01	29.9
Canals (ES)	DFOP	20.5	98.1
Wilson (UK)	SFO	12.5	41.6

The calculated DT_{50} values (Table A 8) are suitable for use as trigger endpoints for additional work.

Table A 8: DT_{50} values for prosulfuron

Soil (code) (ref)	Bogense (DK) [Gezahegne (a)]	Bogense (DK) [Gezahegne (a)]	Bogense (DK) [Gezahegne (a)]
Kinetic Model	SFO	FOMC	DFOP
CAKE output location (report page)	32	36	40
Visual Fit	Poor	Poor	Acceptable
Residuals (visual)	Poor	Poor	Acceptable
$\chi 2$ error (%)	21.6	12.2	8.23
Initial value: estimate / (range) / standard error	16.95 (14.96-18.95) σ : 0.972	21.94 (19.98-23.89) σ : 0.9515	22.33 (20.77-23.9) σ : 0.7606
Rate Parameters: estimate / standard error / probability (trigger:0.05)	k: 0.05117 σ: 0.007169 p = 4.55×10^{-8}	α: 0.3572 σ: 0.04795 95th %ile CI does not contain 0	k_1: 2.989 σ: 2.108 p: 0.08404
		β: 0.5706 σ: 0.255 95th %ile CI does not contain 0	k_2: 0.03143 σ : 0.003858 p: 6.28 x 10-9
			g: 0.4222 σ: 0.03862
DT_{50} (days)	13.6	3.4	4.6
DT_{90} (days)	45.0	359	55.8
FOCUS decision step	SFO unacceptable, fit FOMC	FOMC unacceptable, fit DFOP	DFOP better than FOMC; DFOP selected as best fit

Soil (code) (ref)	Castelsarrasin (FR1) [Gezahegne (b)]	Castelsarrasin (FR1) [Gezahegne (b)]
Kinetic Model	SFO	FOMC

Soil (code) (ref)	Castelsarrasin (FR1) [Gezahegne (b)]	Castelsarrasin (FR1) [Gezahegne (b)]
CAKE output location (report page)	44	48
Visual Fit	Good	Acceptable
Residuals (visual)	Good	Acceptable
$\chi2$ error (%)	12.4	13.2
Initial value: estimate / (range) / standard error	10.05 (8.638-11.46) σ : 0.6843	10.14 (8.696-11.58) σ : 0.6992
Rate Parameters: estimate / standard error / probability (trigger:0.05)	k: 0.06066 σ: 0.01089 p = 4.30×10^{-6}	α: 128.2 σ: not calculated 95th %ile CI not calculated
		β: 2.02 x 103 σ: not calculated 90th %ile CI not calculated
DT_{50} (days)	11.4	10.9
DT_{90} (days)	38.0	36.6
FOCUS decision step	SFO acceptable	FOMC statistically unacceptable. SFO selected as best-fit

Soil (code) (ref)	St. Cyprien (FR2) [Gezahegne (c)]	St. Cyprien (FR2) [Gezahegne (c)]	St. Cyprien (FR2) [Gezahegne (c)]
Kinetic Model	SFO	FOMC	DFOP
CAKE output location (report page)	52	56	60
Visual Fit	Acceptable	Acceptable	Acceptable
Residuals (visual)	Acceptable	Acceptable	Acceptable
$\chi2$ error (%)	13.1	6.9	5.5
Initial value: estimate / (range) / standard error	11.14 (9.619-12.66) σ: 0.746	12.22 (10.31-14.12) σ: 0.934	12.33 (10.3-14.35) σ: 0.9911
Rate Parameters: estimate / standard error / probability (trigger:0.05)	k: 0.02454 σ: 0.004938 p = 1.17×10^{-5}	α: 0.8669 σ: 0.4471 90th %ile CI does not contain 0	k_1: 0.1201 σ: 0.1106 p: 0.1433
		β: 14.99 σ: 14.13	k_2: 0.01126 σ: 0.0064

Soil (code) (ref)	St. Cyprien (FR2) [Gezahegne (c)]	St. Cyprien (FR2) [Gezahegne (c)]	St. Cyprien (FR2) [Gezahegne (c)]
		90th %ile CI contains 0	p: 0.04458
			g: 0.4615 σ: 0.221
DT_{50} (days)	28.3	18.4	61.6
DT_{90} (days)	93.8	198	150
FOCUS decision step	SFO unacceptable; fit FOMC	FOMC unacceptable; fit DFOP	DFOP better than FOMC; DFOP selected as best fit

Soil (code) (ref)	Breitenwisch (DE) [Gezahegne (d)]	Breitenwisch (DE) [Gezahegne (d)]
Kinetic Model	SFO	FOMC
CAKE output location (report page)	64	68
Visual Fit	Good	Poor
Residuals (visual)	Good	Poor
χ2 error (%)	12.6	13.4
Initial value: estimate / (range) / standard error	16.99 (15.48-18.5) σ: 0.7285	17.86 (16.11-19.6) σ: 0.8387
Rate Parameters: estimate / standard error / probability (trigger:0.05)	k: 0.0769 σ: 0.008694 $p = 5.36 \times 10^{-9}$	α: 313.3 σ: 79.77 95th %ile CI does not contain 0
		β: 3.09 x 103 σ: 980.7 95th %ile CI does not contain 0
DT_{50} (days)	9.01	6.85
DT_{90} (days)	29.9	22.8
FOCUS decision step	SFO acceptable	SFO better than FOMC. SFO selected as best-fit.

Soil (code) (ref)	Canals (ES) [Gezahegne (e)]	Canals (ES) [Gezahegne (e)]	Canals (ES) [Gezahegne (e)]
Kinetic Model	SFO	FOMC	DFOP
CAKE output location (report page)	72	76	80
Visual Fit	Good	Good	Good
Residuals (visual)	Good	Good	Good

Soil (code) (ref)	**Canals (ES) [Gezahegne (e)]**	**Canals (ES) [Gezahegne (e)]**	**Canals (ES) [Gezahegne (e)]**
χ2 error (%)	10.1	9.21	6.83
Initial value: estimate / (range) / standard error	16.01 (14.59-17.44) σ: 0.6983	16.58 (14.93-18.22) σ: 0.807	17.79 (15.53-20.05) σ: 1.106
Rate Parameters: estimate / standard error / probability (trigger:0.05)	k: 0.02707 σ: 0.003552 p = 6.79 x 10^{-9}	a: 2.092 σ: 1.443 90^{th} %ile CI contains 0	k_1: 0.4408 σ: 0.424 p: 0.1536
		P: 55.51 σ: 50.76 90^{th} %ile CI contains 0	k_2: 0.02076 σ: 0.004213 p: 1.55 x 10^{-5}
			g: 0.2342 σ: 0.09247
DT_{50} (days)	25.6	21.8	20.5
DT_{90} (days)	85.1	111	98.1
FOCUS decision step	SFO acceptable	FOMC shows improvement over SFO; fit DFOP	DFOP better than FOMC; DFOP selected as best fit

Soil (code) (ref)	**Wilson (UK) [Gezahegne (f)]**	**Wilson (UK) [Gezahegne (f)]**
Kinetic Model	SFO	FOMC
CAKE output location (report page)	84	88
Visual Fit	Acceptable	Poor
Residuals (visual)	Acceptable	Poor
χ2 error (%)	17.8	18.8
Initial value: estimate / (range) / standard error	13.9 (12.37-15.42) σ: 0.7394	14.54 (12.9-16.17) σ: 0.792
Rate Parameters: estimate / standard error / probability (trigger:0.05)	k: 0.05529 σ: 0.007944 p = 1.35 x 10^{-7}	α: 528 σ: not calculated 95^{th} %ile CI not calculated
		β: 7.56 x 103 σ: not calculated 90^{th} %ile CI not calculated
DT_{50} (days)	12.5	9.93
DT_{90} (days)	41.6	33.0
FOCUS decision step	SFO acceptable	FOMC statistically unacceptable. SFO selected as best fit

A 2.3 Hardy, IAJ and Jastrzebski, ND (2016a): Prosulfuron - Kinetic Modelling

Evaluation of Data from Field Soil Dissipation Studies Normalised to 20ºC (Q_{10} 2.58)

Comments of zRMS:	The submitted report was not evaluated. This report was evaluated during active substance renewal.

Reference:	KCP 9.1.1.2.1 / 02
Report	Prosulfuron - Kinetic Modelling Evaluation of Data from Field Soil Dissipation Studies Normalised to 20ºC (Q10 2.58), Hardy, IAJ and Jastrzebski, ND (2016), Batelle UK Ltd., Essex, UK. Report No: NC/15/041A, (Syngenta File No CGA152005_10792; VV-629449).
Guideline(s):	Yes: FOCUS (2006). Guidance document on estimating persistence and degradation kinetics from environmental fate studies on pesticides in EU registration. Report of the FOCUS Work Group on Degradation Kinetics, EC Document Reference Sanco/10058/2005, version 2.0, 434 pp. EFSA, 2014. EFSA Guidance Document for evaluating laboratory and field dissipation studies to obtain $DegT_{50}$ values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal (2014);12(5):3662 37pp.
Deviations:	No
GLP:	Not applicable
Acceptability:	Yes/No/Supplementary

A 2.3.1 Materials and methods

The aim of this evaluation was to conduct a kinetic modelling analysis for prosulfuron from field soil dissipation studies in order to derive normalised field $DegT_{50}$ values (20°C and pF2) for use in subsequent exposure assessments.

In the original data for the Spanish trial, erroneous core diameters were given. This reissued report takes account of the recalculated residue data for this trial resulting from that change in core diameter.

Field soil dissipation studies with prosulfuron have been conducted at six trial sites located in Denmark, France, Germany, Spain and the United Kingdom [Gezahegne (a-f)]. Table A 9 summarises the locations and trial information for the test sites.

Table A 9: Trial information

Location	Reference	Region / Country	Trial type	Application date
Bogense (DK)	Gezahegne (a)	Denmark	Bare soil with sand coverage	1/7/14
Castelsarrasin (FR1)	Gezahegne (b)	France	Bare soil with sand coverage	30/6/14
St. Cyprien (FR2)	Gezahegne (c)	France	Bare soil with sand coverage	23/6/14
Breitenwisch (DE)	Gezahegne(d)	Germany	Bare soil with sand coverage	30/6/14
Canals (ES)	Gezahegne (e)	Spain	Bare soil with sand coverage	23/6/14
Wilson (UK)	Gezahegne (f)	United Kingdom	Bare soil with sand coverage	25/6/14

Spray applications of the active substance at nominal rates of 20 g a.i. ha^{-1} were made, followed by coverage with sand. For all studies, soil samples from depths of 0-100 cm were collected at regular intervals for up to 365 days after application, although it was only necessary to analyse samples through to intervals of 91-184 days after application. No residues were detected in the deepest analysed horizons at any time point. The reported residue data for the trials is summarised in Table A 10.

Table A 10: Summary of reported prosulfuron residue data

Bogense (DK)		Castelsarrasin (FR1)		St. Cyprien (FR2)	
Time (days)	PSF (g ai/ha)	Time (days)	PSF (g ai/ha)	Time (days)	PSF (g ai/ha)
0	23.4	0	10.6	0	14.4
0	19.8	0	10.9	0	11.0
0	23.8	0	11.9	0	10.0
1	13.2	1	11.2	1	14.4
1	12.4	1	8.3	1	12.6
1	13.3	1	3.9	1	9.1
3	13.1	3	12.7	3	6.9
3	12.0	3	5.7	3	14.9
3	14.8	3	6.9	3	10.2
7	9.3	7	9.7	7	5.9
7	9.2	7	6.6	7	11.5
7	8.9	7	5.9	7	8.4
15	8.1	15	4.1	14	3.8
15	5.5	15	3.3	14	12.3
15	8.1	15	5.0	14	3.7
17	7.5	21	2.2	22	6.4
17	7.5	21	1.9	22	3.7

17	8.2	21	2.8	22	5.6
21	6.5	28	2.1	28	4.9
21	5.3	28	1.5	28	4.3
21	7.7	28	1.6	28	5.4
28	4.0	58	0.5	57	2.3
28	5.3	58	0.6	57	5.4
28	5.7	58	0.6	57	5.5
58	3.3	93	0.7	87	1.4
58	2.5	93	0.2	87	2.9
58	3.6	93	0.7	87	2.7
93	1.3	-	-	113	1.4
93	1.3	-	-	113	1.7
93	2.3	-	-	113	2.1
-	-	-	-	175	0.5
-	-	-	-	175	0.5
-	-	-	-	175	0.8
Breitenwisch (DE)		**Canals (ES)**		**Wilson (UK)**	
Time (days)	**PSF (g ai/ha)**	**Time (days)**	**PSF (g ai/ha)**	**Time (days)**	**PSF (g ai/ha)**
0	15.5	0	19.5	0	14.6
0	15.1	0	13.3	0	12.0
0	14.0	0	19.4	0	10.0
1	14.4	1	17.5	1	13.2
1	16.9	1	19.9	1	12.6
1	21.2	1	13.2	1	10.3
3	15.2	3	14.1	3	14.0
3	13.5	3	10.8	3	17.0
3	12.1	3	15.4	3	15.1
7	13.0	7	9.1	7	8.2
7	10.6	7	9.3	7	11.7
7	11.2	7	16.0	7	8.8
15	4.3	14	11.1	13	7.6
15	3.2	14	8.5	13	8.1
15	3.3	14	11.2	13	6.1
21	3.0	21	11.1	21	1.7
21	3.3	21	8.8	21	2.9
21	3.7	21	9.2	21	2.9
30	1.7	29	7.9	28	3.2

30	1.3	29	6.4	28	2.3
30	1.6	29	8.8	28	2.1
59	0.6	58	3.9	57	1.6
59	0.6	58	1.9	57	1.5
59	0.5	58	2.2	57	1.6
-	-	91	3.0	91	1.2
-	-	91	2.4	91	0.8
-	-	91	2.5	91	0.7
-	-	116	2.1	-	-
-	-	116	1.2	-	-
-	-	116	1.7	-	-
-	-	184	0.1	-	-
-	-	184	0.1	-	-
-	-	184	0.1	-	-

A 2.3.2 Results and discussions

Kinetic modelling analysis of the data from prosulfuron field soil dissipation studies showed good model fits for all of the trials. The $DegT_{50}$ values normalised to 20°C and pF2 can be used for environmental exposure assessments.

For the Bogense (DK) trial, the SFO model did not provide an acceptable fit. Therefore the FOMC model was attempted since 10% of the initial value is reached within the experiment period. However, the FOMC fit is not visually acceptable as the values for later time points give consistently negative residuals and poor fit around the DT_{90}. The FOCUS guidance allows a case-by-case decision to be made here. It was decided to fit the DFOP model as per the left- hand branch of the flowchart. DFOP gave a good visual and statistical fit and was chosen as the best fit. In spite of the DT_{90} being within the experimental period, the DFOP slow phase k_2 was used to calculate the DT_{50} as being more representative of the EFSA, 2014 approaches (yielding a more conservative DT_{50} than back calculating from the overall DT_{90}).
The aim of this evaluation was to conduct a kinetic modelling analysis of prosulfuron data from field soil degradation studies in order to derive normalised $DegT_{50}$ values (20°C and pF2) for use in subsequent exposure assessments.

Measured daily on-site soil temperatures were used, taken directly from the study data. Daily soil moisture contents were derived from PEARL evaluations with meteorological data from on-site weather stations. Data for a warm-up period prior to the study were taken from MARS. Normalisation was conducted for soil temperature (20ºC) and soil moisture (pF2).

All datasets were evaluated against FOCUS Kinetics criteria based on visual assessment, minimum chi^2 error of <25% and t-test parameter significance >=95%. FOCUS Kinetics does not quote an acceptable minimum chi^2 error for field data, merely stating that it will be higher than laboratory data due to the inherent variability. A value of 25% has been taken as a realistic value. As with laboratory data, values above this may still be acceptable based on further expert assessment of the data.
The calculated $DegT_{50}$ values Table A 11 and Table A 12 are suitable for use in environmental modelling as they have been corrected to the standard conditions of 20°C (and moisture at pF2 (10 kPa; 0.1 bar).
The kinetic evaluations yielded a total of six $DegT_{50}$ values for prosulfuron which have been used to calculate the geometric mean $DegT_{50}$ of 20.8 days. This value is suitable for use in environmental models.

Table A 11: Summary of modelling endpoint $DegT_{50}$ values for prosulfuron

Soil Name	**Soil texture**	**Soil pH ($CaCl_2$)**	**$DegT_{50}$ (days)**	**Kinetic Model**	**Reference**
Bogense (DK)	Sandy loam	5.07	23.3	DFOP k_2	Gezahegne (a)
Castelsarrasin (FR1)	Silt loam	4.94	13.9	SFO	Gezahegne (b)
St. Cyprien (FR2)	Loam	6.71	43.2	SFO	Gezahegne(c)
Breitenwisch (DE)	Clay loam	4.89	10.1	SFO	Gezahegne (d)
Canals (ES)	Clay	7.75	53.7	SFO	Gezahegne (e)
Wilson (UK)	Loam	7.16	11.9	SFO	Gezahegne (f)
Geometric mean			21.2		

Table A 12: $DegT_{50}$ values for prosulfuron normalised to reference conditions of 20°C and pF2

Soil (code) (ref)	**Bogense (DK) [Gezahegne (a)]**	**Bogense (DK) [Gezahegne (a)]**	**Bogense (DK) [Gezahegne (a)]**
Kinetic Model	SFO	FOMC	DFOP
Cake output location (report page)	36	40	44
Visual Fit	Poor	Poor	Good
Residuals (visual)	Poor	Poor	Good
$\chi 2$ error (%)	22.6	12.3	7.65
Initial value: estimate / (range) / standard error	P_{ini}: 16.43 (14.45-18.42) σ: 0.9676	P_{ini}: 22.01 (20.04-23.99) σ: 0.9629	P_{ini}: 22.33 (20.82-23.85) σ: 0.737
Rate Parameters: estimate / standard error / probability (trigger:0.05)	k: 0.04785 σ: 0.007206 p: 1.67×10^{-7}	α: 0.3224 σ: 0.04098 95th %ile CI does not contain 0	k_1: 3.193 σ: 1.544 p: 0.02433
		β: 0.3636 σ: 0.1671 90th %ile CI does not contain 0	k_2: 0.0297 σ: 0.003391 p: 1.56×10^{-9}
			g: 0.4386 a: 0.03483
$DegT_{50}$ (days)	14.5	138[a]	23.3[b]
$DegT_{90}$ (days)	48.1	459	77.4[c]
FOCUS decision step	SFO unacceptable; 10% of P_{lm} reached within experimental period; fit FOMC	FOMC unacceptable (poor fit around DT90 and the end of the study); expert judgement; fit DFOP	DFOP better than FOMC, acceptable; DFOP selected as best fit. Slow phase k_2 used to calculate DT_{50} as worst case

[a] $DegT_{90}$ / 3.32
[b] k_2 $DegT_{50}$
[c] k_2 $DegT_{90}$

Soil (code) (ref)	Castelsarrasin (FR1) [Gezahegne (b)]	St. Cyprien (FR2) [Gezahegne (c)]
Kinetic Model	SFO	SFO
Cake output location (report page)	48	52
Visual Fit	Good	Good
Residuals (visual)	Good	Good
$\chi 2$ error (%)	12.6	14.6
Initial value: estimate / (range) / standard error	P_{ini}: 10.01 (8.601-11.41) σ: 0.6817	P_{ini}: 10.96 (9.44-12.48) σ: 0.746
Rate Parameters: estimate / standard error / probability (trigger:0.05)	k: 0.04975 σ: 0.009049 $p = 5.17 \times 10^{-6}$	k: 0.01603 σ: 0.00339 $p = 2.33 \times 10^{-5}$
$DegT_{50}$ (days)	13.9	43.2
$DegT_{90}$ (days)	46.3	144
FOCUS decision step	SFO acceptable	

Soil (code) (ref)	Breitenwisch (DE) [Gezahegne (d)]	Canals (ES) [Gezahegne (e)]	Wilson (UK) [Gezahegne (f)]
Kinetic Model	SFO	SFO	SFO
CAKE output loation (report page)	56	60	64
Visual Fit	Good	Good	Acceptable
Residuals (visual)	Good	Good	Acceptable
$\chi 2$ error (%)	11.3	11.1	18.3
Initial value: estimate / (range) / standard error	P_{ini}: 16.54 (15.18-17.89) σ: 0.6524	P_{ini}: 15.71 (14.31-17.12) σ: 0.6889	P_{ini}: 13.91 (12.34-15.48) σ: 0.7626
Rate Parameters: estimate / standard error / probability / break point (trigger:0.05)	k: 0.06879 σ: 0.00789 $p = 6.87 \times 10^{-9}$	k: 0.01291 σ: 0.001758 $p = 1.45 \times 10^{-8}$	k: 0.0584 σ: 0.008748 $p = 2.70 \times 10^{-7}$
$DegT_{50}$ (days)	10.1	53.7	11.9
$DegT_{90}$ (days)	33.5	178	39.4
FOCUS decision step	SFO acceptable		

A 2.4 Crabtree, G (2014): SYN547308 - Adsorption and Desorption Properties of ^{14}C-SYN547308, a Metabolite of Prosulfuron

Comments of zRMS:	The submitted report was not evaluated. This report was evaluated during active substance renewal.

Reference: KCP 9.1.2 / 01

Report SYN547308 - Adsorption and Desorption Properties of 14C-SYN547308, a Metabolite of Prosulfuron, Crabtree, G (2014), Smithers Viscient (ESG) Ltd., Otley Road, Harrogate, North Yorkshire HG3 1PY, UK. Report No

3200461. (Syngenta file No SYN547308_10010; VV-409563).

Guideline(s): Yes:
OECD Guidelines for the Testing of Chemicals, Guideline 106: Adsorption/Desorption using a Batch Equilibrium Method (adopted 21st January 2000).

US EPA, Fate, Transport and Transport and Transformation Test Guidelines, EPA 712-C-08-012, OPPTS 835.1230: Adsorption/Desorption (Batch Equilibrium) (October 2008)

Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC

Deviations: No

GLP: Yes

Acceptability: Yes/No/Supplementary

A 2.4.1 Executive Summary

The adsorption/desorption characteristics of ^{14}C-SYN547308 was studied in five different soils: Vetroz (loam; Switzerland), 18 Acres (sandy clay loam; UK), Krone (silt loam; USA), Madera (sandy loam; USA) and Sarpy (silt loam; USA) using a standard batch equilibrium method, in the dark at 20°C. The chemical was added to soil : aqueous slurries (resulting in a final nominal composition of 10 g of soil: 10 mL aqueous 0.01M $CaCl_2$ for all five soils to achieve five nominal rates of application (0.01, 0.04, 0.1, 0.4 and 1.0 µg/mL). The soil adsorption coefficients K_d and K_{OC}, together with the Freundlich adsorption constants K_F and K_{FOC}, were determined for each soil.

The mean mass balance from all soils was 98.5% (range 97.1 – 100.5%).

SYN547308 adsorbed to all three soils with K_{Foc} values of 65 to 288 L/kg and mean slope (1/n) of 0.9982 and 0.9993. The K_{Foc} and slope (1/n) values for desorption of SYN546108 were 73 to 368 and 0.9061 to 0.9956, respectively. A summary of the key values is shown in Table A 13.

The desorption constants of SYN547308 were similar to the adsorption constants.

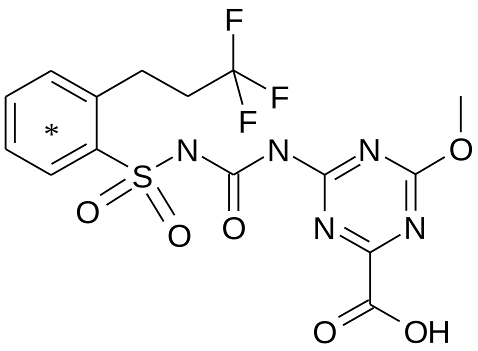
Table A 13: Soil adsorption constants for SYN547308 in 3 Soils

Parameter	Vetroz	18 Acres	Krone	Madera	Sarpy
Texture	Loam	Sandy clay loam	Silt loam	Sandy loam	Silt loam
pH (0.01M $CaCl_2$)	7.7	5.8	5.0	7.3	6.4
%OC	2.3	3.0	1.3	0.5	1.8
Adsorption					
K_F	1.49	2.89	3.74	0.42	2.23
K_{FOC}	65	96	288	83	124
1/n	0.9318	0.9527	0.9501	0.9193	0.9127
r^2	0.9992	0.9990	0.9993	0.9982	0.9989
Kd (averaged)	1.87	3.46	4.56	0.52	3.09

Parameter	Vetroz	18 Acres	Krone	Madera	Sarpy
K_{OC} (averaged)	81	115	351	104	172
Desorption					
K_F	1.69	4.18	4.79	0.53	2.63
K_{FOC}	73	139	368	105	146
1/n	0.9327	0.9956	0.9638	0.9185	0.9061
r^2	0.9997	0.9971	0.9997	0.9986	0.9991
Kd (averaged)	2.15	4.27	5.58	0.69	3.86
K_{OC} (averaged)	93	142	429	138	214

A 2.4.2 Materials

Test Material: **SYN547308**



Lot/Batch #: CDC-XXXVI-89-1

Purity: 97.6%

Stability of test compound: Stable, determined within study

Application vehicle: 0.01M $CaCl_2$

Soils: Five soils were used for the study, soils which were chosen to represent arable farming conditions in respect of soil texture and pH.

Name	Vetroz	18 Acres	Krone	Madera	Sarpy
Sampling location	CH-1896 Vouvry, Les Barges, Switzerland	Jealott’s Hill Farm, Bracknell, UK	Krone Switzerland	Madera County, California, USA	Louisville, Sarpy, Nebraska, USA
Date of collection	11 October 2013	04 September 2013	09 September 2013	15 January 2013	11 October 2010
Sampling depth (cm)	5-20 cm	5-20 cm	2-20 cm	0-15 cm	0-15 cm

Name	Vetroz	18 Acres	Krone	Madera	Sarpy
Storage conditions	in the dark, at room temperature, in loosely tied plastic bags	in the dark, at room temperature, in loosely tied plastic bags	in the dark, at room temperature, in loosely tied plastic bags	in the dark, at room temperature, in loosely tied plastic bags	in the dark, at room temperature, in loosely tied plastic bags
Duration of storage[1]	144	176	169	181	151
Particle size (% w/w):[2] Clay (<2 µm)	23	25[4]	16	11[6]	25[6]
Silt (50-2 µm)	44	24[4]	65	16[6]	56[6]
Sand (2000-50 µm)	33	51[4]	19	73[6]	19[6]
Texture (USDA)	Loam	Sandy clay loam[4]	Silt loam	Sandy loam	Silt loam[6]
Taxonomy, Order (Suborder)	Not Known	Alfisols (Aqualf)	Alfisol (Udalf)	Mollisol (Udoll)	Mollisol (Udoll)
pH (water)	8.3	6.5	6.0	8.2	6.7[6]
pH (0.01 M $CaCl_2$)	7.7	5.8	5.0	7.3	6.4[6]
Organic matter (%)	4.0	5.2	2.2	0.9[6]	3.1[6]
Organic carbon (%)	2.3	3.0	1.3	0.5[7]	1.8[7]
CEC[3] (mmol/kg)	108	189[5]	166	96[7]	16.7[6]
Nitrogen content (%)	0.410	0.469	0.294	0.02[6]	0.13[6]
C/N ratio	1:0.178	1:0.156	1:0.266	1:0.04[7]	1:0.072[7]

[1] From arrival at Test Facility to last dispensing of definitive test (days)
[2] USDA particle size distribution
[3] Cation Exchange Capacity
[4] Not determined at Test Facility, no claim of GLP compliance is made for this. Analysis supplied by Syngenta (Technical Letter_Soil data summary 2007)
[5] Calculated at Test Facility, based on data provided from Syngenta (Technical Letter_Soil data summary 2007). No claim of compliance is made for this data
[6] Not determined at Test Facility but provided from a third party, no claim of GLP compliance is made for this analysis
[7] Calculated at Test Facility, based on data provided from a third party, no claim of compliance is made for this data

A 2.4.3 Study Design and Methods

Experimental design

The definitive experiment was performed using all five soils, with a 24 hour adsorption and desorption step using nominal soil:aqueous ratio of 1:1 for all soils. This ratio resulted in 29.1 – 83.1% mean adsorption to soil. SYN547308 was applied to soil:aqueous slurries resulting in initial aqueous concentrations of 0.01, 0.040, 0.098, 0.387 and 0.987 µg/mL.

Mass balance was determined after the desorption phase for each soil using the samples treated at the highest concentration (1 µg/mL) and for Krone soil at 0.4, 0.1, 0.04 and 0.01 µg/mL.

Adsorption phase

Parameter	Description
Soil condition	Air dried soil, passed through 2 mm sieve prior to use
Same batch of soils used in other study type	NA
Soil sample weight	10 g (dry weight) per replicate
Equilibration solution	0.01M $CaCl_2$: 9.0 mL per replicate
Control conditions	No soil (test item in 0.01M $CaCl_2$ only)
Test apparatus	Plastic tubes and seals

Number of replicates	Treatments	2 (at each concentration, per soil)
Test material application	Identity of solvent	Treated in 0.01M $CaCl_2$
	Volume of test solution used/treatment	1.0 mL
	Application method	Glass pipette
	Evaporation of application solvent	No
Test material concentration	Nominal application rates (µg ai/mL)	0.01 0.04 0.1 0.4 1.0
	Actual application rates (µg ai/mL)	0.010 0.040 0.010 0.389 (Vetroz, 18 Acres and Krone), 0.385 (Madera and Sarpy) 0.998 (Vetroz, 18 Acres and Krone), 0.976 (Madera and Sarpy)
Soil: Solution ratio (w/v)		1:1
Indication of test material adsorbing to walls of test apparatus		No
Equilibration conditions	Temperature (°C)	20 ± 2
	Time	24 hours
	Continuous darkness (Yes/No):	Yes
	Shaking method	Reciprocal
Method of separation of supernatant		Centrifugation
Centrifugation	Speed (*g*)	4800
	Duration (min)	9 minutes
	Method of separating supernatant	Decanting

Desorption phase

Parameter		Description
Soil samples from adsorption phase used		Yes
Number of desorption cycles		1
Amount of test item present in the adsorbed state/adsorbed amount (mg a.i./kg soil)		Vetroz: 0.062 to 5.239 18 Acres :0.076 to 7.327 Krone : 0.080 to 7.793 Madera :0.027 to 2.057 Sarpy: 0.075 to 6.178
Equilibration solution		0.01M $CaCl_2$ - 10 mL
Control conditions		Not done
Number of replicates (treated samples		2
Soil: Solution ratio (w/v)		1:1
Equilibration	Temperature (°C)	20 ± 2

conditions	Time	24 hours
	Continuous darkness (Yes/No):	Yes
	Shaking method	Reciprocal
Method of separation of supernatant		Centrifugation
Centrifugation	Speed (g)	4800
	Duration (min)	9 minutes
	Method of separating supernatant	Decanting

Description of analytical procedures

Samples were radioassayed using LSC and reverse phase HPLC with radio-detection.

A 2.4.4 Results and discussions

SYN547308 adsorbed to all five soils with a mean K_{FOC} value of 131.2 mL/g and mean slope (1/n) of 0.933. The mean K_{FOC} and slope (1/n) values for desorption of SYN547308 from all three five soils were 166.2 and 0.9433, respectively.

Mass Balance

Soil	Nominal treatment rate (µg/mL)	Adsorption supernatant (%)	Desorption supernatant (%)	Soil extract (%)	Unextracted residues (%)	Total recovery (%)
Vetroz	1	20.3	15.1	61.0	2.4	98.8
18 Acres	1	13.1	9.7	66.8	8.8	98.4
Krone	1	11.6	8.0	74.2	4.1	97.9
Madera	1	44.3	22.3	32.0	1.9	100.5
Sarpy	1	16.0	11.6	65.1	6.0	98.7
Krone	0.4	8.8	6.5	77.3	4.5	97.1
Krone	0.1	9.3	7.1	77.5	4.0	97.9
Krone	0.04	8.7	6.9	77.8	4.1	97.5
Krone	0.01	9.0	6.4	84.3	ND	99.7

ND =Not Detected or 0.1% AR
Unextracted residues includes acetone rinse,
Recovery based on calculated amount applied.

The results showed that SYN547308 was present in aqueous supernatant solutions as well as in the soil extracts. The mass balance showed mean recoveries between 97.1 % and 100.5 % of applied SYN547308 for Vertroz, 18 Acres, Krone, Madera and Sarpy soils.

A 2.4.5 Conclusion

The adsorption properties of ^{14}C SYN547308 were studied in five soils, namely Vetroz, 18 Acres, Krone, Madera and Sarpy.

SYN547308 was more strongly sorbed to Krone soil than Vetroz, 18 Acres, Madera and Sarpy soils.

Mean values for adsorption partition coefficients (Kd) per soil were in the range of 0.52 to 4.56 L/kg and the corresponding K_{OC} values were in the range of 81 to 351 L/kg. Freundlich adsorption coefficients (K_F) were in the range 0.42 to 3.74 L/kg and when corrected for organic carbon (K_{FOC}) were in the range of 65 to 288 L/kg.

Using the McCall Classification scale to assess a chemical's potential mobility in soil (based on its K_{FOC}), SYN547308 can be classified as having a "high" potential mobility in Vetroz, 18 Acres, Madera and Sarpy soils and a "medium" potential mobility in Krone soil.

Appendix 3 Additional information provided by the applicant

A 3.1 Prosulfuron Metabolites- Predicted Environmental Concentrations in soil (PEC_S) (KCP 9.1.3)

Plateau Concentration

In addition to the seasonal PEC_S calculations, the potential accumulation of prosulfuron metabolites in soil following repeated annual applications of A18385B to maize was calculated.

Potential accumulation of prosulfuron metabolites in soil ($PEC_{S,accumulation}$), expressed as background concentration resulting from long-term use, were calculated separately using the equations given below based on repeat of the application scheme every year.

The maximum plateau concentration ($PEC_{S,max.plateau}$) was calculated as follows:

$$PEC_{S,max.plateau}\ (mg/kg) = \frac{PEC_{S,ini,d}}{(1 - e^{(-tk)})}$$

Where:
$PEC_{S,ini,d}$ = $PEC_{S,ini}$ calculated for 5 cm soil depth [mg/kg]
t = time interval between the application schemes [d] (every year = 365d)

The maximum plateau concentration in soil resulting from long-term use was calculated for a soil depth of 20 cm since soil incorporation by ploughing between application schemes could be expected for maize.

The minimum plateau concentration ($PEC_{S,plateau}$), i.e. the minimum concentration in soil before the first annual application, was calculated as:

$$PEC_{S,plateau}\ [mg/kg] = PEC_{S,max.plateau} \times e^{(-tk)}$$

Where:
t = time interval between the last annual application and the first application in the subsequent season [d]

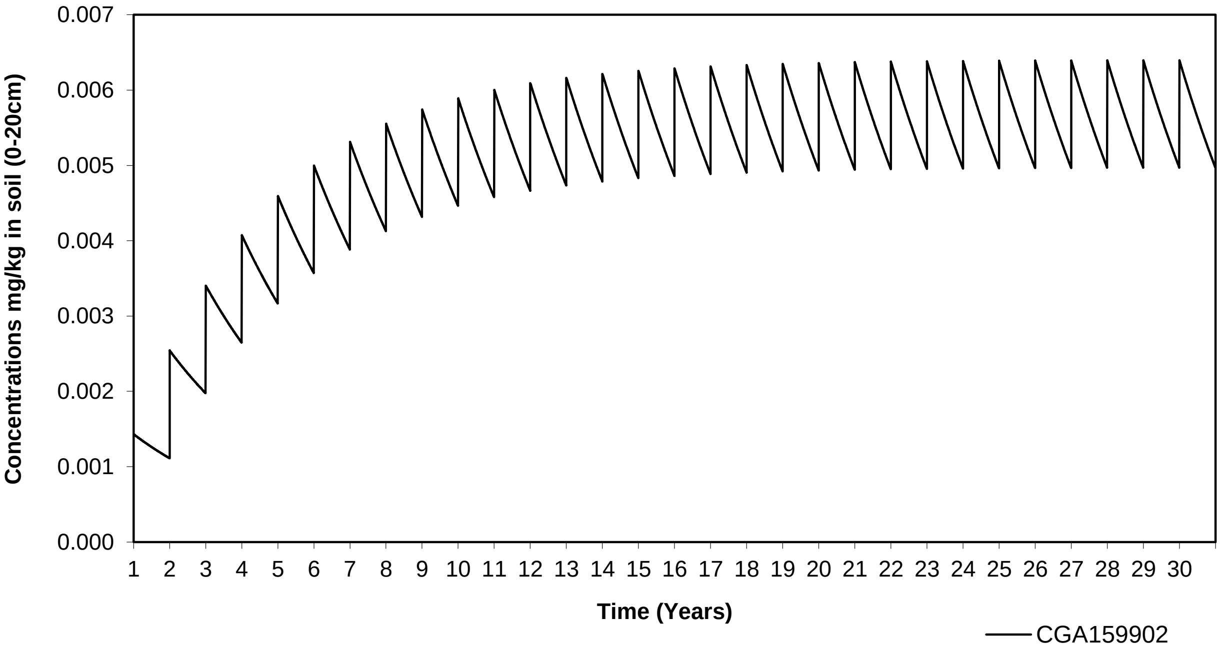
The peak accumulated PEC_S ($PEC_{S,accumulation}$) was calculated as the sum of the plateau concentration before the first annual application ($PEC_{S,plateau}$) and the initial $PEC_{S,ini}$ (calculated for 5 cm soil depth) immediately after the last application:

$$PEC_{S,accumulation}\ [mg/kg] = PEC_{S,plateau} + PEC_{S,ini}$$

Potential accumulation of prosulfuron metabolites CGA150829, CGA159902, SYN542604, CGA349707 and SYN547308 in soil ($PEC_{S,accumulation}$), expressed as background concentration resulting from long-term use, were calculated using the equations given above based on repeat of the application scheme every year for 30 years. Results are summarised in Table 8.7-5, Table 8.7-6, Table 8.7-8, Table 8.7-9 and Table 8.7-11, respectively.

Since the worst case $PEC_{S,accumulation}$ (0.011 mg/kg) was obtained for CGA159902 following applications of 1 × 20 g prosulfuron/ha to maize, the resulting saw-tooth curve displaying the decay and accumulation of CGA159902 for consecutive annual applications of prosulfuron is shown for this metabolite only (Figure A 1).
Prosulfuron metabolite CGA159902 residues reached a minimum plateau ($PEC_{S,plateau}$) of 0.005 mg/kg immediately before the annual application in year 29. The initial $PEC_{S,ini}$ (calculated for 5 cm soil depth) immediately after application is 0.006 mg/kg, see Section 8.7.2.1 Therefore, the $PEC_{S,accumulation}$ is calculated to be 0.011 mg/kg.

Figure A 1: Predicted Environmental Concentrations prosulfuron metabolite CGA159902 in soil (PEC_S) over a depth of 20 cm following annual application at 1 x 20 g a.s./ha to maize over approximately 30 years



A 3.2 De Vries, K (2016): Prosulfuron – Endpoint Selection

Comments of zRMS:	The submitted report was not evaluated. This report was evaluated during active substance renewal.

Reference: KCP 9.2.4 / 01

Report: Prosulfuron - A Leaching Assessment for Parent and Soil Metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707, CGA325025 and SYN547308 Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Various Crops in the EU, De Vries, K (2016) Dr. Knoell Consult GmbH, Mannheim, Germany. Report No 103276-2. (Syngenta File No CGA152005_10795; VV-629994)

Guideline(s): Yes:
EFSA (2014b). Guidance Document for evaluating laboratory and field dissipation studies to obtain DegT50 values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal, 12(5): 3662.

EC (2014). Assessing potential for movement of active substances and their metabolites to groundwater in the EU. Report of the FOCUS Groundwater Work Group, EC Document Reference Sanco/13144/2010 version 3, 613 pp.

FOCUS (2000). FOCUS groundwater scenarios in the EU review of active substances. Report of the FOCUS groundwater scenarios workgroup, EC document reference Sanco/321/2000 rev. 2, 202 pp.

FOCUS (2014). Generic guidance for Tier 1 FOCUS groundwater assessments, version 2.2 FOCUS groundwater scenarios working group.

Deviations: No

GLP: Yes

Acceptability: Yes/No/Supplementary

A 3.2.1 Summary

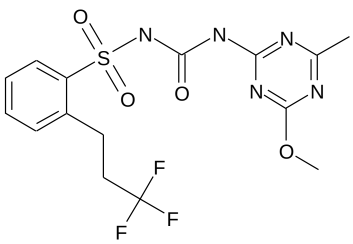
The following summary for the endpoint selection of the metabolite SYN547308 is available in the appendix of the above listed report:
Following application of prosulfuron to 4 aerobic soils under laboratory conditions, SYN547308 (M18) was only observed in a single soil at 2.6% of applied radioactivity (AR) after 62 days incubation reaching a maximum of 9.9% AR after 120 days (Fahrbach, 2011, see Table A 14 for selected data and Figure A 2 for structures). As direct inter-conversion of a triazine-methyl group to a carboxylic acid is extremely unlikely, and no other credible precursors are observed, it has to be assumed that SYN547308 is formed from parent *via* one or more transient intermediates. This conjecture is supported by the very late formation of SYN547308 during the incubation, with no significant amounts observed until more than 60% of the applied parent had degraded at about day 62.

Table A 14: Prosulfuron and SYN547308 from Vetroz soil as %AR (Fahrbach, 2011)

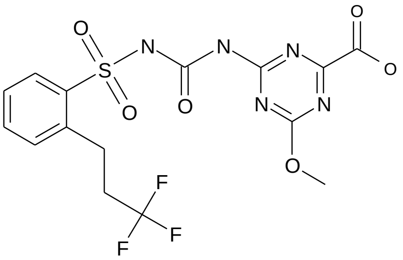
Timepoint (days)	Prosulfuron (%)	SYN547308 (%)
0	98.8	0

Timepoint (days)	Prosulfuron (%)	SYN547308 (%)
0	95.5	0
3	90.2	0
3	88.7	0
7	90.4	0
7	87	0
14	76.6	0
14	79.3	0
28	60.5	0
28	61.6	0
62	36.4	2.1
62	36.7	3.2
90	19.7	7.7
90	19.2	8.8
120	11.6	9.9
120	11	9.8

Figure A 2: Structures of parent prosulfuron and SYN547308



Prosulfuron

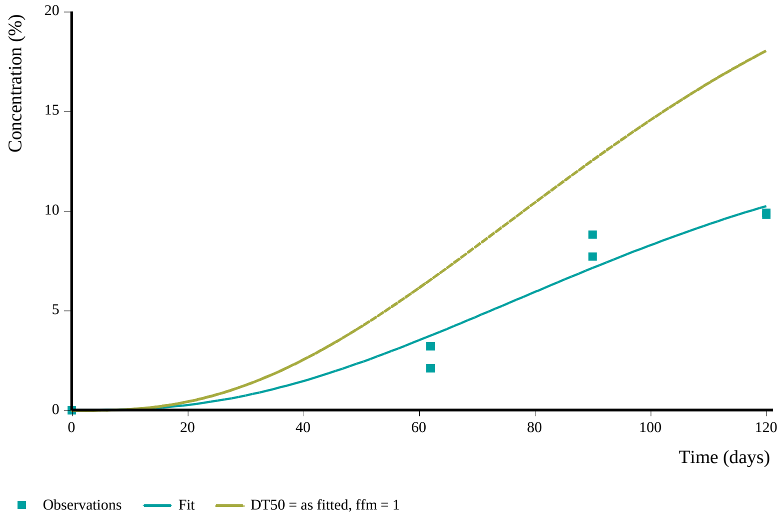


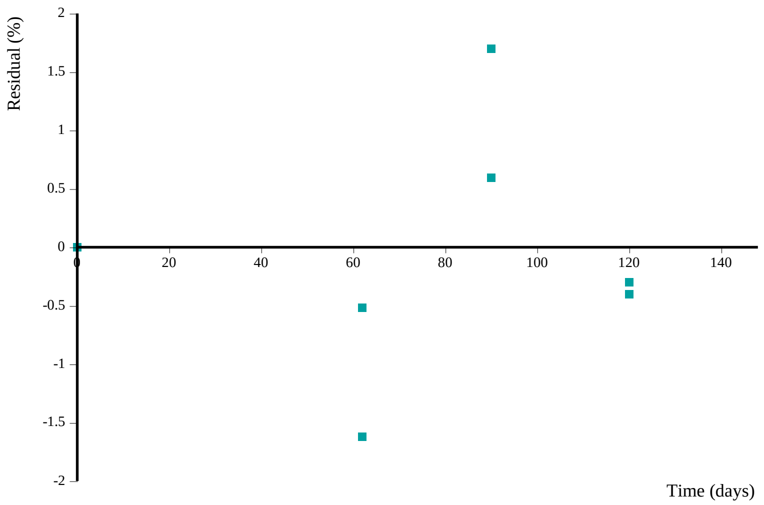
SYN547308 (M18)

In order to conduct an environmental risk assessment, the degradation rate of SYN547308 was determined in three aerobic laboratory soils treated with 14C-SYN547308. The geometric mean DegT50 from the three soils was 67 days (range 36 – 207 days, Patel, 2014).

It was not possible to determine a reliable DegT50 and formation fraction for SYN547308 from the Fahrbach (2011) study; due to the late appearance of SYN547308 there were only data available for three time points. However, using the DegT50 of 67 days and fitting to the Fahrbach (2011) data it can be seen that a formation fraction of 0.5 provides an acceptable fit to the data (Figure A 3). For comparison, a line showing that a formation fraction of 1.0 is not appropriate to the data has been added.

Figure A 3: Best fit of SYN547308 formation fraction from prosulfuron degradation from the study of Fahrbach (2011)





A 3.2.2 Conclusion

In conclusion, the proposed degradation endpoints for SYN547308 which are suitable for use in environmental models are a $DegT_{50}$ of 67 days with a formation fraction of 0.5.

A 3.3 De Vries, K (2016): Prosulfuron - A Leaching Assessment for Parent and Soil Metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707, CGA325025 and SYN547308 Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Various Crops in the EU

Comments of zRMS:	The submitted report was not evaluated. This report was evaluated during active substance renewal.

Reference: KCP 9.2.4 / 01

Report: Prosulfuron - A Leaching Assessment for Parent and Soil Metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707, CGA325025 and SYN547308 Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Various Crops in the EU, de Vries, K (2016), Dr. Knoell Consult GmbH, Mannheim, Germany, Report No 103276-2. (Syngenta File No CGA152005_10795; VV-630378)

Guideline(s): Yes:
EFSA, 2014. Guidance Document for evaluating laboratory and field dissipation studies to obtain $DegT_{50}$ values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal, 12(5): 3662.

European Commission (2014). Assessing potential for movement of active substances and their metabolites to groundwater in the EU. Report of the FOCUS groundwater work group, EC document reference Sanco/13144/2010 version 3, 613 pp.

FOCUS (2000). FOCUS groundwater scenarios in the EU review of active substances. Report of the FOCUS groundwater scenarios workgroup, EC document reference Sanco/321/2000 rev. 2, 202 pp.

FOCUS (2014). Generic guidance for Tier 1 FOCUS groundwater assessments, version 2.2. FOCUS groundwater scenarios working group.

Deviations: No

GLP: Not applicable

Acceptability: Yes/No/Supplementary

A 3.3.1 Materials and methods

This report describes a FOCUS groundwater modelling study that examined the potential for prosulfuron and its metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707, CGA325025 and SYN547308 to reach groundwater following application to maize, winter cereals and spring cereals. The FOCUS simulation models FOCUS PEARL (v4.4.4), FOCUS PELMO (v5.5.3) and MACRO (v5.5.4) were used in the modelling study.

For prosulfuron, a tiered approach was undertaken, the degradation and dissipation of prosulfuron were studied in soil under laboratory and field conditions, respectively; they were both considered in this modelling study and simulated separately as Tier 1 and Tier 2.

- The laboratory DT_{50} (Tier 1) was obtained from fifteen studies and details are given in the EFSA conclusion (EFSA, 2014). A normalised (20ºC/Q10 = 2.58, pF2) geometric mean value of 62.1 days was used for modelling. The arithmetic mean sorption parameters were chosen as stated in the EU review of prosulfuron.
- The field DT_{50} (Tier 2) of 20.8 days[15] was used in modelling. Detailed field $DegT_{50}$ data (Tier 2, calculated in accordance with EFSA 2014 guidance for evaluating laboratory and field dissipation studies to obtain $DegT_{50}$ values) can be found in 8.4. Tier 2 was further refined as explained below:
    - At Tier 2a, the arithmetic mean sorption parameters were chosen as stated in the EU review of prosulfuron.
    - According to current guidance the geometric mean K_{FOC} / K_{FOM} value was taken forward for modelling, at Tier 2b (EFSA, 2014;[16] European Commission, 2014[17])
    - For Tier 2c the application pattern was changed to an application every 2nd year.

For all Tiers a default plant uptake factor for systemic compounds of 0.5 was employed.

Single foliar applications each at a rate of 15, 16 and 20 g a.s./ha, from approximately BBCH 12 were considered for application on Maize. Single foliar applications at a rate of 15 g a.s./ha, from approximately BBCH 21 were considered application on winter cereals and spring cereals. The input parameters relating to application are shown in Table A 15, below.

Table A 15: Application patterns of prosulfuron to maize, winter cereals and spring cereals used in modelling

Use No	1	2	3	4	5
Crop	Maize	Maize	Maize	Winter cereals	Spring cereals
Application rate (g as/ha)	15	16	20	15	15
Number of applications/interval (d)	1/-	1/-	1/-	1/-	1/-
Relative application date/BBCH growth stage	3[a] / 12-18	3[a] / 12-18	3[a] / 12-18	-[b]/21-32	7[a] / 21-32
Crop interception (%)	25	25	25	20	20
Frequency of application	Annual				
Models used for calculation	FOCUS PEARL v4.4.4, FOCUS PELMO v5.5.3, MACRO v5.5.4				

[a] The application date was set to 3/7 days post-emergence
[b] For winter cereals fixed dates were used

Applications were considered for the FOCUS scenarios in PEARL and PELMO Châteaudun, Hamburg, Kremsmünster, Okehampton, Piacenza, Porto, Sevilla and Thiva for maize, Châteaudun, Hamburg,

[15] The value of 20.8 days was taken from the original issued report by Hardy & Jastrzebski, 2015. In the meantime the report was re-issued with a corrected geometric mean value of 21.2 days.
[16] FOCUS (2014): Generic Guidance for FOCUS Surface Water Scenarios, version 1.2.
[17] European Commission (2014) "Assessing Potential for Movement of Active Substances and their Metabolites to Ground Water in the EU" Report of the FOCUS Ground Water Work Group, EC Document Reference Sanco/13144/2010 version 3

Jokioinen, Kremsmünster, Okehampton, Piacenza, Porto, Sevilla and Thiva for winter cereals and Châteaudun, Hamburg, Jokioinen, Kremsmünster, Okehampton and Porto for spring cereals. For MACRO, only the scenario Châteaudun is defined. Application dates are presented in Table A 16 below. For maize and spring cerals the dates were selected with the tool AppDate (v2.0b). Simulations were carried out using the FOCUS standard crops maize, winter cereals and spring cereals in FOCUS PEARL and PELMO as well as in FOCUS-MACRO. Simulations were carried out over 26 years, as proposed by FOCUS for pesticides that are applied annually. The first 6 years are intended to be a 'warm up' period, thus the following 20 years were taken into account for the assessment of the leaching behaviour.

Table A 16: Application dates of prosulfuron to maize, winter cereals and spring cereals used in modelling

Crop	Scenario	Application dates (absolute)
Maize Use No1, 2, 3	Châteaudun	4-May
	Hamburg	8-May
	Kremsmünster	8-May
	Okehampton	28-May
	Piacenza	18-May
	Porto	4-May
	Sevilla	10-Mar
	Thiva	23-Apr
Winter cereals[a] Use No4	Châteaudun	1-Mar
	Hamburg	1-Mar
	Jokioinen	1-Apr
	Kremsmünster	1-Mar
	Okehampton	1-Mar
	Piacenza	1-Mar
	Porto	1-Mar
	Sevilla	1-Mar
	Thiva	1-Mar
Spring cereals Use No5	Châteaudun	17-Mar
	Hamburg	8-Apr
	Jokioinen	25-May
	Kremsmünster	8-Apr
	Okehampton	8-Apr
	Porto	17-Mar

[a] For winter cereals fixed dates were used

The input parameters of prosulfuron and its metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707, CGA325025 and SYN547308 used in modelling are shown in Table A 17 and Table A 18 below. All other input values were set at the default values unless otherwise stated. A schematic diagram of the modelled route of degradation of prosulfuron in soil is shown in Figure A 4. Since the complex degradation scheme of active substance cannot be implemented in the GUI of MACRO, all metabolites were assumed to form directly from active substance. For this purpose, the formation fraction of secondary metabolites was corrected for the formation of preceding metabolites, e.g.:

$FF(tot)_{P \rightarrow met\ 2} = FF_{P \rightarrow met\ 1} \times FF_{met\ 1 \rightarrow met\ 2}$

Additionally, molar based formation fractions have to be corrected for molar mass differences between metabolite and parent to get conversion fractions for MACRO.

Table A 17: Summary of input parameters for prosulfuron, CGA150829, CGA159902, CGA300406 for PEC_{GW} calculations

Compound	Prosulfuron	CGA150829	CGA159902	CGA300406	Value in accordance to EU endpoint Reference
Molar mass (g/mol)	419.4	140.1	253.2	405.4	Yes / EFSA, 2014
Water solubility (mg/L)	4000 (25°C)	1000 (20°C)	1000 (20°C)	1000 (20°C)	Yes / EFSA, 2014
Saturated vapour pressure (Pa)	$<3.5 \times 10^{-6}$ (20°C)	0	0	0	Loss due to volatilisation was not considered → worst case
DT_{50} in soil (d) lab	62.1 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 10)[a]	196 (median, normalisation to 10 kPa or pF2, 20 °C with Q10 of 2.58, n = 18)	188 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q10 of 2.58, n = 5)	acidic soil: 4.3 (max, n = 4) alkaline soils: 30.2 (max, n = 3)	Yes / EFSA, 2014
DT_{50} in soil (d) field	20.8 (geomean normalisation to pF2, 20 °C with Q10 of 2.58, n = 6)	-	-	-	No, Hardy& Jastrzebski (2015)
Transformation rate lab[b]	Pathway A 0.005246 to CGA300406 0.005916 to CO_2 Pathway B 0.003125 to CGA150829 0.004800 to CGA159902 0.003237 to CO_2	0.003536 to CO_2	0.003687 to CO_2	0.141853 to SYN542604[c] 0.019344 to CGA325025[c] 0.020198 to SYN542604[d] 0.002754 to CGA325025[d]	calculated

Compound	**Prosulfuron**	**CGA150829**	**CGA159902**	**CGA300406**	**Value in accordance to EU endpoint** **Reference**
	Pathway C 0.005581 to SYN547308 0.005581 to CO_2				
Transformation rate field[b]	Pathway A 0.017515 to CGA300406 0.019751 to CO_2 Pathway B 0.010434 to CGA150829 0.016024 to CGA159902 0.010807 to CO_2 Pathway C 0.018633 to SYN547308 0.018633 to CO_2	0.003536 to CO_2	0.003687 to CO_2	0.141853 to SYN542604[c] 0.019344 to CGA325025[c] 0.020198 to SYN542604[d] 0.002754 to CGA325025[d]	calculated
K_{FOC} / K_{FOM} (mL/g), Tier 1, Tier 2a	14.2/ 8.3 (arithmetic mean n = 8)	73.8 / 42.8 (arithmetic, n = 26)[e]	70.6 / 41.0 (arithmetic, n = 4)	46.9 / 27.2 (arithmetic, n = 3)	Yes EFSA, 2014 K_{FOM} calculated from K_{FOC} $K_{FOM} = K_{FOC}$ / 1.724
K_{FOC} / K_{FOM} (mL/g), Tier 2b, Tier 2c	11.7/ 6.8 (geomean, n = 8)	50.7 / 29.4 (geomean, n = 26)[e]	68.0 / 39.4 (geomean, n = 4)	46.8 / 27.1 (geomean, n = 3)	Yes EFSA, 2014 K_{FOM} calculated from K_{FOC} $K_{FOM} = K_{FOC}$ / 1.724
1/n	0.869 (arithmetic mean, n = 8)	0.858 (arithmetic mean, n = 26)[e]	0.880 (arithmetic mean, n = 4)	0.900 (arithmetic mean, n = 3)	Yes EFSA, 2014
Plant uptake factor	0.5	0	0	0	Default for systemic compounds
Formation fraction	-	0.280 from parent	0.430 from parent	0.470 from parent	Yes EFSA, 2014
Conversion fraction[f]	-	0.094 from parent	0.260 from parent	0.454 from parent	Calculated
Washoff Factor (1/m) (PEARL)	0.0001	0.0001	0.0001	0.0001	Default

Compound	Prosulfuron	CGA150829	CGA159902	CGA300406	Value in accordance to EU endpoint Reference
Foliar DT_{50} (d)	10	10	10	10	Default

[a] Total n=15; geometric mean of replicate soils calculated first
[b] For PELMO; (ln(2) / DT_{50}) * FFm
[c] Representing acidic soils
[d] Representing alkaline soils
[e] EFSA, 2014 presents n=27. One K_{foc} and 1/n value was excluded from the calculation of the geomean value since 1/n with 1.422 was significantly outside the range of expected values i.e. below 0.6 or above 1.1.
[f] For use in FOCUS MACRO, formation fraction corrected for molar mass differences and multiplied along the pathway for secondary metabolites

Table A 18: Summary of input parameters for SYN542604, CGA349707, CGA325025 and SYN547308 for PEC_{GW} calculations

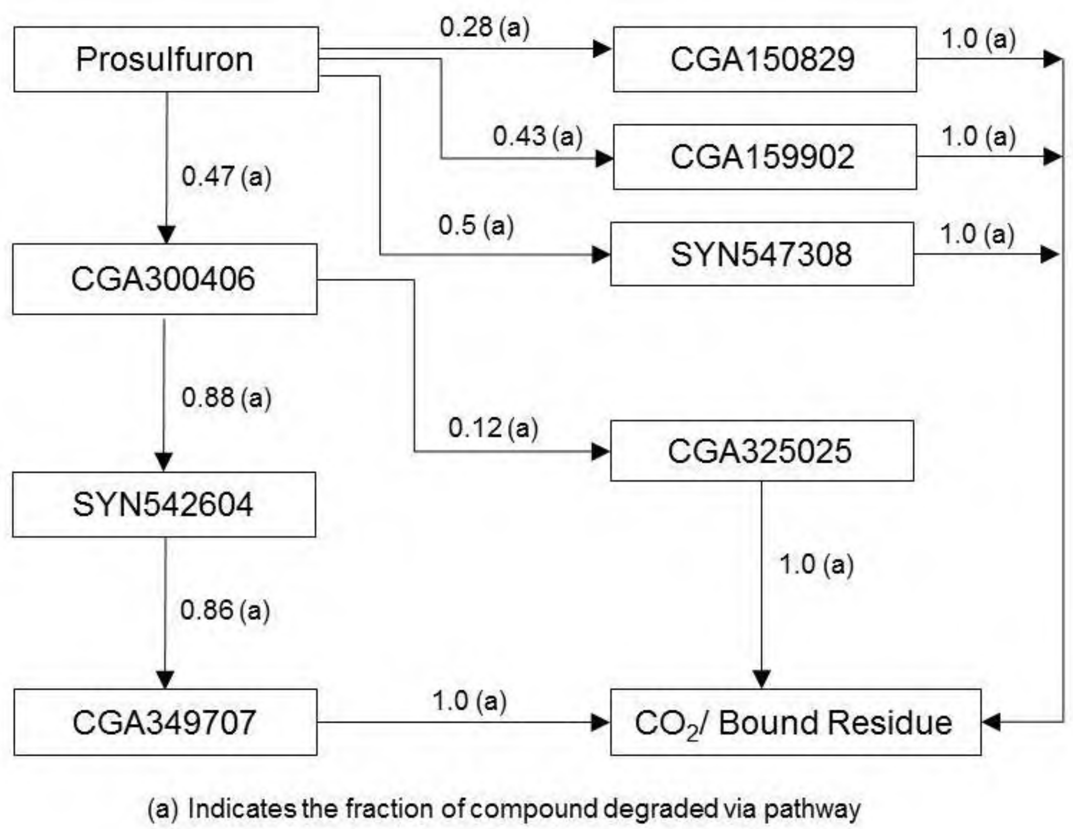
Compound	SYN542604	CGA349707	CGA325025	SYN547308	Value in accordance to EU endpoint Reference
Molar mass (g/mol)	381.3	338.3	404.4	449.4	Yes / EFSA, 2014
Water solubility (mg/L)	1000 (20°C)	1000 (20°C)	1000 (20°C)	1000 (20°C)	Yes / EFSA, 2014
Saturated vapour pressure (Pa)	0	0	0	0	Loss due to volatilisation was not considered → worst case
DT_{50} in soil (d) lab	84.6 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 8)[a]	153 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 4)	62.4 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 3)	67.1 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n = 3)	Yes / EFSA, 2014; No, Patel (2014) for SYN547308
Transformation rate[a]	0.007046 to CGA349707 0.001147 to CO_2	0.004530 to CO_2	0.011108 to CO_2	0.010330 to CO_2	
K_{FOC} / K_{FOM} (mL/g), Tier 1, Tier 2a	123 / 71.3 (arithmetic mean, n = 3)	44.4 / 25.8 (arithmetic mean, n = 3)	26.6 / 15.4 (arithmetic mean, n = 4)	131.2 / 76.1 (arithmetic mean, n = 5)	Yes / EFSA, 2014 K_{FOM} calculated from K_{FOC} K_{FOM} = K_{FOC} / 1.724
K_{FOC} / K_{FOM} (mL/g), Tier 2b, Tier 2c	111.1 / 64.5 (geomean, n = 3)	44.0 / 25.5 (geomean, n = 3)	26.2 / 15.2 (geomean, n = 4)	113.1 / 65.6 (geomean, n = 5)	Yes / EFSA, 2014 K_{FOM} calculated from K_{FOC} K_{FOM} = K_{FOC} / 1.724
1/n	0.850 (arithmetic	0.960 (arithmetic	0.973 (arithmetic	0.933 (arithmetic	Yes / EFSA, 2014

Compound	**SYN542604**	**CGA349707**	**CGA325025**	**SYN547308**	**Value in accordance to EU endpoint Reference**
	mean, n = 5)	mean, n = 3)	mean, n = 4)	mean, n = 5)	
Plant uptake factor	0	0	0	0	Default
Formation fraction	0.880 from CGA300406	0.860 from SYN542604	0.120 from CGA300406	0.5 from parent	Yes / EFSA, 2014
Conversion fraction[b]	0.376 from parent	0.287 from parent	0.054 from parent	0.536 from parent	
Washoff Factor (1/m) (PEARL)	0.0001	0.0001	0.0001	0.0001	Default
Foliar DT_{50} (d)	10	10	10	10	Default

[a] For PELMO; (ln(2) / DT_{50}) * FFm

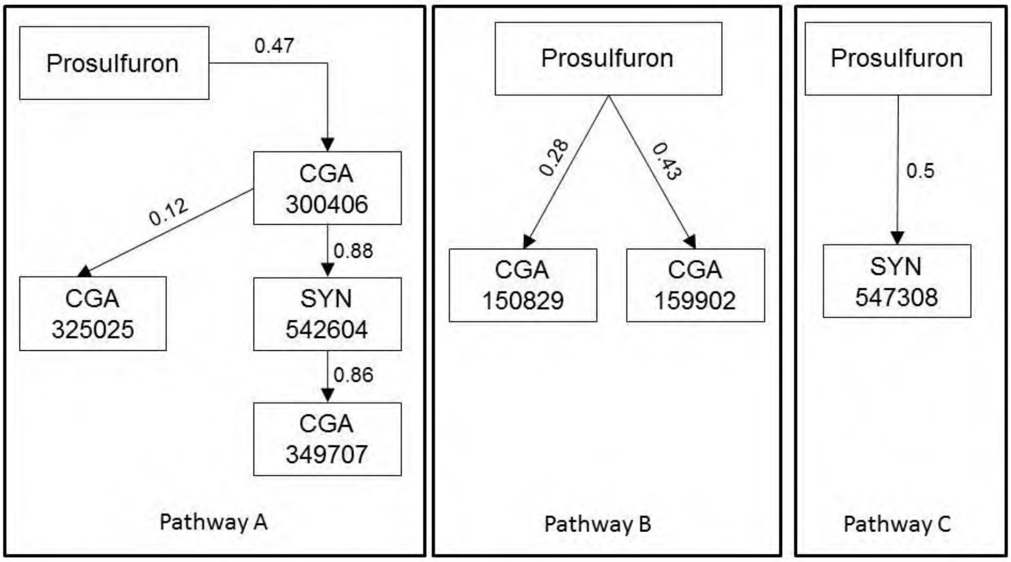
[b] For use in FOCUS MACRO, formation fraction corrected for molar mass differences and multiplied along the pathway for secondary metabolites

Figure A 4: Schematic diagram of the modelled route of degradation of prosulfuron



Added together, the total formation fraction from prosulfuron to all the metabolites is greater than one, which indicates that this approach is a conservative implementation of the metabolic pathway. With the FOCUS-PELMO model, this cannot be represented in a single simulation. Therefore, calculations were performed in three separate pathways, i.e. Pathway A, Pathway B and Pathway C, which are shown in following figure.

Figure A 5: Degradation Pathways simulated with the FOCUS PELMO 5.5.3 model to represent the degradation of prosulfuron



A 3.3.2 Results

Predicted environmental concentrations for prosulfuron and its metabolites CGA150829, CGA159902, CGA300406, SYN542604, CGA349707, CGA325025 and SYN547308 in groundwater (PEC_{GW}) were calculated for the use prosulfuron on maize, winter cereals and spring cereals in Europe in accordance with FOCUS guidelines (FOCUS, 2000, 2014, 2014).

The 80th percentile (at 1 m soil depth) PEC_{GW} values generated by the FOCUS PEARL, FOCUS PELMO and MACRO simulations are given in Table A 19 to Table A 40.

Table A 19: **PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406, (with FOCUS PEARL v4.4.4) Tier 1**

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
Maize 1 x 15 g a.s./ha	Châteaudun	0.430	0.047	0.192	0.066
	Hamburg	0.657	0.054	0.215	0.089
	Kremsmünster	0.517	0.050	0.194	0.077
	Okehampton	0.513	0.042	0.156	0.067
	Piacenza	0.298	0.045	0.192	0.054
	Porto	0.177	0.018	0.079	0.020
	Sevilla	0.025	0.003	0.019	0.003
	Thiva	0.255	0.049	0.224	0.042
Maize 1 x 16 g a.s./ha	Châteaudun	0.461	0.051	0.206	0.071
	Hamburg	0.705	0.058	0.231	0.095
	Kremsmünster	0.555	0.054	0.208	0.083
	Okehampton	0.549	0.045	0.168	0.072
	Piacenza	0.320	0.049	0.206	0.058
	Porto	0.190	0.019	0.084	0.022
	Sevilla	0.026	0.003	0.021	0.004
	Thiva	0.274	0.053	0.242	0.045
Maize 1 x 20 g a.s./ha	Châteaudun	0.586	0.066	0.262	0.091
	Hamburg	0.900	0.075	0.293	0.121
	Kremsmünster	0.707	0.070	0.265	0.107
	Okehampton	0.697	0.057	0.212	0.092
	Piacenza	0.407	0.063	0.266	0.074
	Porto	0.240	0.025	0.108	0.028
	Sevilla	0.033	0.004	0.027	0.004
	Thiva	0.350	0.070	0.312	0.059
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.400	0.057	0.236	0.065
	Hamburg	0.754	0.068	0.269	0.107
	Jokioinen	0.618	0.047	0.219	0.074
	Kremsmünster	0.584	0.062	0.231	0.095
	Okehampton	0.623	0.053	0.188	0.090
	Piacenza	0.391	0.057	0.230	0.071
	Porto	0.311	0.033	0.135	0.041
	Sevilla	0.038	0.002	0.011	0.001
	Thiva	0.163	0.045	0.217	0.028
Spring cereals	Châteaudun	0.307	0.042	0.179	0.046

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
	Hamburg	0.777	0.073	0.284	0.109
	Jokioinen	0.656	0.043	0.190	0.074
	Kremsmünster	0.580	0.064	0.243	0.095
	Okehampton	0.524	0.047	0.178	0.074
	Porto	0.216	0.023	0.095	0.026

Table A 20: PEC_{GW} for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PEARL v4.4.4) Tier 1

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 15 g a.s./ha	Châteaudun	0.047	0.276	0.040	0.103
	Hamburg	0.042	0.456	0.048	0.086
	Kremsmünster	0.013	0.204	0.026	0.031
	Okehampton	0.002	0.134	0.010	0.005
	Piacenza	0.039	0.633	0.054	0.075
	Porto	0.054	0.453	0.055	0.108
	Sevilla	0.061	0.520	0.076	0.134
	Thiva	0.063	0.389	0.053	0.121
Maize 1 x 16 g a.s./ha	Châteaudun	0.051	0.294	0.043	0.111
	Hamburg	0.045	0.487	0.051	0.092
	Kremsmünster	0.014	0.218	0.028	0.033
	Okehampton	0.002	0.142	0.010	0.005
	Piacenza	0.042	0.676	0.058	0.080
	Porto	0.070	0.564	0.069	0.138
	Sevilla	0.079	0.648	0.094	0.169
	Thiva	0.082	0.484	0.066	0.155
Maize 1 x 20 g a.s./ha	Châteaudun	0.066	0.364	0.053	0.139
	Hamburg	0.058	0.609	0.065	0.117
	Kremsmünster	0.018	0.271	0.034	0.042
	Okehampton	0.002	0.178	0.013	0.007
	Piacenza	0.057	0.850	0.072	0.102
	Porto	0.053	0.634	0.057	0.104
	Sevilla	0.076	0.581	0.080	0.159
	Thiva	0.043	0.646	0.093	0.101
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.075	0.411	0.051	0.149
	Hamburg	0.065	0.321	0.046	0.138
	Jokioinen	0.062	0.512	0.046	0.118
	Kremsmünster	0.027	0.339	0.040	0.063
	Okehampton	0.001	0.119	0.013	0.003
	Piacenza	0.030	0.701	0.046	0.055
	Porto	0.037	0.451	0.044	0.077
	Sevilla	0.076	0.644	0.090	0.159
	Thiva	0.042	0.519	0.072	0.101
Spring cereals	Châteaudun	0.074	0.444	0.054	0.141

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	**CGA349707**	**CGA325025**	**SYN547308**
	Hamburg	0.053	0.306	0.043	0.113
	Jokioinen	0.016	0.244	0.030	0.038
	Kremsmünster	0.047	0.276	0.040	0.103
	Okehampton	0.042	0.456	0.048	0.086
	Porto	0.013	0.204	0.026	0.031

Table A 21: **PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PELMO v5.5.3) Tier 1**

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 15 g a.s./ha	Châteaudun	0.249	0.033	0.140	0.042
	Hamburg	0.373	0.032	0.133	0.045
	Kremsmünster	0.394	0.035	0.139	0.055
	Okehampton	0.417	0.034	0.128	0.053
	Piacenza	0.234	0.027	0.111	0.040
	Porto	0.126	0.013	0.059	0.014
	Sevilla	0.023	0.002	0.015	0.003
	Thiva	0.138	0.026	0.127	0.020
Maize 1 x 16 g a.s./ha	Châteaudun	0.267	0.035	0.150	0.045
	Hamburg	0.399	0.034	0.142	0.048
	Kremsmünster	0.423	0.038	0.149	0.059
	Okehampton	0.446	0.036	0.137	0.057
	Piacenza	0.250	0.030	0.120	0.043
	Porto	0.135	0.014	0.063	0.015
	Sevilla	0.025	0.002	0.017	0.004
	Thiva	0.148	0.028	0.137	0.022
Maize 1 x 20 g a.s./ha	Châteaudun	0.343	0.046	0.192	0.057
	Hamburg	0.504	0.044	0.181	0.061
	Kremsmünster	0.540	0.049	0.189	0.075
	Okehampton	0.561	0.046	0.174	0.072
	Piacenza	0.315	0.038	0.152	0.054
	Porto	0.170	0.018	0.080	0.019
	Sevilla	0.031	0.003	0.022	0.004
	Thiva	0.189	0.036	0.175	0.028
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.312	0.046	0.204	0.050
	Hamburg	0.627	0.058	0.227	0.081
	Jokioinen	0.553	0.037	0.170	0.059
	Kremsmünster	0.530	0.057	0.208	0.085
	Okehampton	0.623	0.049	0.175	0.083
	Piacenza	0.442	0.056	0.212	0.073
	Porto	0.284	0.028	0.107	0.037
	Sevilla	0.040	0.003	0.019	0.006
	Thiva	0.099	0.017	0.100	0.014
Spring cereals	Châteaudun	0.179	0.027	0.123	0.031

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
	Hamburg	0.409	0.038	0.156	0.052
	Jokioinen	0.552	0.032	0.141	0.052
	Kremsmünster	0.469	0.044	0.171	0.066
	Okehampton	0.421	0.035	0.136	0.056
	Porto	0.239	0.019	0.078	0.027

Table A 22: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PELMO v5.5.3) Tier 1

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 15 g a.s./ha	Châteaudun	0.032	0.342	0.039	0.066
	Hamburg	0.031	0.311	0.045	0.071
	Kremsmünster	0.039	0.301	0.039	0.082
	Okehampton	0.036	0.226	0.033	0.080
	Piacenza	0.029	0.229	0.029	0.058
	Porto	0.009	0.160	0.021	0.022
	Sevilla	0.002	0.119	0.009	0.005
	Thiva	0.018	0.351	0.031	0.038
Maize 1 x 16 g a.s./ha	Châteaudun	0.034	0.364	0.042	0.070
	Hamburg	0.034	0.331	0.047	0.076
	Kremsmünster	0.042	0.320	0.042	0.088
	Okehampton	0.039	0.240	0.035	0.086
	Piacenza	0.031	0.244	0.031	0.062
	Porto	0.009	0.171	0.022	0.023
	Sevilla	0.002	0.127	0.009	0.005
	Thiva	0.020	0.374	0.033	0.040
Maize 1 x 20 g a.s./ha	Châteaudun	0.045	0.454	0.052	0.090
	Hamburg	0.043	0.409	0.059	0.095
	Kremsmünster	0.054	0.397	0.052	0.111
	Okehampton	0.050	0.298	0.044	0.108
	Piacenza	0.041	0.303	0.038	0.079
	Porto	0.012	0.212	0.027	0.030
	Sevilla	0.002	0.160	0.012	0.006
	Thiva	0.026	0.468	0.041	0.051
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.042	0.485	0.047	0.085
	Hamburg	0.062	0.470	0.066	0.129
	Jokioinen	0.033	0.470	0.066	0.080
	Kremsmünster	0.066	0.402	0.052	0.129
	Okehampton	0.059	0.283	0.041	0.129
	Piacenza	0.058	0.517	0.051	0.119
	Porto	0.022	0.278	0.032	0.053
	Sevilla	0.003	0.189	0.014	0.008
	Thiva	0.010	0.365	0.025	0.022
Spring cereals	Châteaudun	0.024	0.329	0.032	0.052

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	**CGA349707**	**CGA325025**	**SYN547308**
	Hamburg	0.037	0.372	0.050	0.081
	Jokioinen	0.029	0.395	0.056	0.073
	Kremsmünster	0.050	0.343	0.044	0.101
	Okehampton	0.037	0.233	0.033	0.083
	Porto	0.015	0.188	0.024	0.035

Table A 23: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406, (with FOCUS PEARL v4.4.4) Tier 2a

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 15 g a.s./ha	Châteaudun	0.023	0.039	0.175	0.022
	Hamburg	0.056	0.052	0.227	0.045
	Kremsmünster	0.041	0.042	0.175	0.041
	Okehampton	0.065	0.048	0.188	0.051
	Piacenza	0.012	0.034	0.158	0.024
	Porto	0.004	0.018	0.081	0.007
	Sevilla	<0.001	0.001	0.018	<0.001
	Thiva	0.005	0.032	0.173	0.007
Maize 1 x 16 g a.s./ha	Châteaudun	0.025	0.042	0.188	0.024
	Hamburg	0.060	0.056	0.244	0.049
	Kremsmünster	0.044	0.046	0.188	0.045
	Okehampton	0.070	0.051	0.202	0.055
	Piacenza	0.013	0.037	0.171	0.026
	Porto	0.005	0.019	0.087	0.008
	Sevilla	<0.001	0.002	0.020	<0.001
	Thiva	0.006	0.035	0.188	0.008
Maize 1 x 20 g a.s./ha	Châteaudun	0.034	0.055	0.244	0.032
	Hamburg	0.078	0.073	0.311	0.064
	Kremsmünster	0.059	0.060	0.242	0.058
	Okehampton	0.092	0.067	0.257	0.072
	Piacenza	0.017	0.048	0.225	0.033
	Porto	0.006	0.025	0.114	0.010
	Sevilla	<0.001	0.002	0.027	<0.001
	Thiva	0.008	0.046	0.246	0.010
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.011	0.035	0.181	0.014
	Hamburg	0.065	0.069	0.284	0.059
	Jokioinen	0.039	0.033	0.175	0.025
	Kremsmünster	0.052	0.053	0.216	0.053
	Okehampton	0.082	0.063	0.229	0.073
	Piacenza	0.034	0.049	0.189	0.041
	Porto	0.018	0.030	0.128	0.022
	Sevilla	<0.001	<0.001	0.004	<0.001
	Thiva	<0.001	0.023	0.154	0.002
Spring cereals	Châteaudun	0.007	0.024	0.131	0.007

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
	Hamburg	0.062	0.067	0.282	0.053
	Jokioinen	0.039	0.033	0.173	0.029
	Kremsmünster	0.057	0.054	0.216	0.056
	Okehampton	0.053	0.051	0.205	0.049
	Porto	0.009	0.023	0.104	0.013

Table A 24: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PEARL v4.4.4) Tier 2a

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 15 g a.s./ha	Châteaudun	0.027	0.507	0.056	0.043
	Hamburg	0.041	0.642	0.082	0.067
	Kremsmünster	0.039	0.446	0.057	0.066
	Okehampton	0.047	0.373	0.051	0.087
	Piacenza	0.025	0.532	0.047	0.046
	Porto	0.007	0.256	0.029	0.017
	Sevilla	<0.001	0.188	0.011	<0.001
	Thiva	0.012	0.648	0.049	0.016
Maize 1 x 16 g a.s./ha	Châteaudun	0.029	0.542	0.060	0.047
	Hamburg	0.044	0.686	0.087	0.072
	Kremsmünster	0.043	0.476	0.061	0.071
	Okehampton	0.051	0.398	0.054	0.093
	Piacenza	0.027	0.569	0.050	0.050
	Porto	0.008	0.274	0.031	0.018
	Sevilla	<0.001	0.201	0.012	<0.001
	Thiva	0.013	0.694	0.053	0.018
Maize 1 x 20 g a.s./ha	Châteaudun	0.040	0.681	0.075	0.061
	Hamburg	0.060	0.860	0.110	0.093
	Kremsmünster	0.057	0.596	0.077	0.093
	Okehampton	0.068	0.497	0.068	0.121
	Piacenza	0.037	0.716	0.063	0.064
	Porto	0.010	0.344	0.039	0.023
	Sevilla	<0.001	0.253	0.015	<0.001
	Thiva	0.018	0.878	0.066	0.023
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.015	0.604	0.051	0.028
	Hamburg	0.060	0.749	0.091	0.101
	Jokioinen	0.018	0.701	0.086	0.036
	Kremsmünster	0.055	0.503	0.058	0.095
	Okehampton	0.070	0.433	0.058	0.126
	Piacenza	0.047	0.549	0.042	0.080
	Porto	0.020	0.382	0.038	0.039
	Sevilla	<0.001	0.099	0.010	<0.001
	Thiva	0.002	0.688	0.033	0.006
Spring cereals	Châteaudun	0.008	0.466	0.039	0.017

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	**CGA349707**	**CGA325025**	**SYN547308**
	Hamburg	0.053	0.838	0.102	0.087
	Jokioinen	0.021	0.581	0.074	0.042
	Kremsmünster	0.055	0.548	0.062	0.089
	Okehampton	0.049	0.413	0.054	0.085
	Porto	0.010	0.300	0.033	0.024

Table A 25: **PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PELMO v5.5.3) Tier 2a**

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 15 g a.s./ha	Châteaudun	0.009	0.026	0.130	0.011
	Hamburg	0.031	0.034	0.157	0.022
	Kremsmünster	0.028	0.033	0.147	0.027
	Okehampton	0.051	0.040	0.159	0.041
	Piacenza	0.014	0.027	0.119	0.024
	Porto	0.003	0.015	0.069	0.006
	Sevilla	<0.001	0.001	0.013	<0.001
	Thiva	0.002	0.019	0.109	0.003
Maize 1 x 16 g a.s./ha	Châteaudun	0.010	0.028	0.140	0.012
	Hamburg	0.034	0.037	0.169	0.024
	Kremsmünster	0.031	0.036	0.158	0.029
	Okehampton	0.055	0.043	0.171	0.044
	Piacenza	0.015	0.030	0.128	0.026
	Porto	0.003	0.016	0.075	0.007
	Sevilla	<0.001	0.001	0.014	<0.001
	Thiva	0.002	0.021	0.118	0.003
Maize 1 x 20 g a.s./ha	Châteaudun	0.013	0.037	0.181	0.016
	Hamburg	0.043	0.047	0.215	0.031
	Kremsmünster	0.041	0.048	0.202	0.039
	Okehampton	0.073	0.056	0.220	0.058
	Piacenza	0.020	0.038	0.166	0.034
	Porto	0.005	0.021	0.099	0.009
	Sevilla	<0.001	0.002	0.020	<0.001
	Thiva	0.003	0.028	0.157	0.004
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.007	0.028	0.158	0.008
	Hamburg	0.072	0.067	0.269	0.067
	Jokioinen	0.037	0.031	0.164	0.024
	Kremsmünster	0.056	0.057	0.223	0.059
	Okehampton	0.093	0.063	0.226	0.076
	Piacenza	0.030	0.052	0.211	0.045
	Porto	0.022	0.030	0.129	0.025
	Sevilla	<0.001	0.001	0.009	<0.001
	Thiva	<0.001	0.009	0.073	0.001
Spring cereals	Châteaudun	0.002	0.015	0.091	0.003

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
	Hamburg	0.025	0.039	0.174	0.023
	Jokioinen	0.034	0.025	0.139	0.020
	Kremsmünster	0.040	0.043	0.176	0.038
	Okehampton	0.043	0.039	0.167	0.037
	Porto	0.018	0.023	0.098	0.020

Table A 26: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PELMO v5.5.3) Tier 2a

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 15 g a.s./ha	Châteaudun	0.013	0.428	0.043	0.022
	Hamburg	0.022	0.443	0.053	0.040
	Kremsmünster	0.028	0.406	0.045	0.047
	Okehampton	0.035	0.322	0.044	0.066
	Piacenza	0.023	0.310	0.037	0.047
	Porto	0.005	0.229	0.025	0.014
	Sevilla	<0.001	0.172	0.010	<0.001
	Thiva	0.004	0.443	0.034	0.007
Maize 1 x 16 g a.s./ha	Châteaudun	0.014	0.457	0.046	0.023
	Hamburg	0.024	0.472	0.057	0.043
	Kremsmünster	0.031	0.433	0.048	0.050
	Okehampton	0.038	0.344	0.047	0.071
	Piacenza	0.025	0.330	0.039	0.050
	Porto	0.006	0.245	0.026	0.015
	Sevilla	<0.001	0.184	0.011	<0.001
	Thiva	0.005	0.473	0.036	0.008
Maize 1 x 20 g a.s./ha	Châteaudun	0.019	0.576	0.058	0.031
	Hamburg	0.032	0.589	0.071	0.057
	Kremsmünster	0.041	0.540	0.061	0.065
	Okehampton	0.051	0.429	0.059	0.092
	Piacenza	0.033	0.413	0.049	0.064
	Porto	0.008	0.306	0.033	0.019
	Sevilla	<0.001	0.232	0.014	<0.001
	Thiva	0.007	0.593	0.046	0.011
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.010	0.529	0.044	0.019
	Hamburg	0.059	0.651	0.082	0.108
	Jokioinen	0.017	0.581	0.079	0.036
	Kremsmünster	0.059	0.523	0.061	0.106
	Okehampton	0.069	0.408	0.054	0.131
	Piacenza	0.044	0.614	0.048	0.085
	Porto	0.018	0.365	0.035	0.040
	Sevilla	<0.001	0.200	0.011	<0.001
	Thiva	0.001	0.397	0.019	0.002
Spring cereals	Châteaudun	0.004	0.372	0.030	0.008

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	**CGA349707**	**CGA325025**	**SYN547308**
	Hamburg	0.026	0.521	0.061	0.044
	Jokioinen	0.015	0.493	0.063	0.030
	Kremsmünster	0.038	0.452	0.051	0.064
	Okehampton	0.035	0.333	0.044	0.066
	Porto	0.012	0.264	0.030	0.028

Table A 27: **PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PEARL v4.4.4) Tier 2b**

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 15 g a.s./ha	Châteaudun	0.033	0.068	0.186	0.025
	Hamburg	0.078	0.085	0.234	0.049
	Kremsmünster	0.057	0.067	0.185	0.047
	Okehampton	0.080	0.070	0.192	0.055
	Piacenza	0.016	0.063	0.172	0.025
	Porto	0.006	0.031	0.086	0.008
	Sevilla	<0.001	0.007	0.020	<0.001
	Thiva	0.008	0.069	0.186	0.008
Maize 1 x 16 g a.s./ha	Châteaudun	0.036	0.073	0.200	0.027
	Hamburg	0.085	0.092	0.252	0.052
	Kremsmünster	0.061	0.072	0.198	0.051
	Okehampton	0.087	0.075	0.206	0.059
	Piacenza	0.017	0.068	0.185	0.027
	Porto	0.007	0.033	0.092	0.008
	Sevilla	<0.001	0.007	0.021	<0.001
	Thiva	0.008	0.074	0.201	0.009
Maize 1 x 20 g a.s./ha	Châteaudun	0.047	0.096	0.261	0.035
	Hamburg	0.112	0.119	0.325	0.069
	Kremsmünster	0.080	0.093	0.254	0.066
	Okehampton	0.112	0.096	0.263	0.076
	Piacenza	0.022	0.088	0.240	0.035
	Porto	0.009	0.043	0.119	0.011
	Sevilla	<0.001	0.010	0.029	<0.001
	Thiva	0.011	0.099	0.266	0.012
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.019	0.073	0.198	0.017
	Hamburg	0.098	0.109	0.298	0.067
	Jokioinen	0.067	0.070	0.194	0.032
	Kremsmünster	0.070	0.084	0.232	0.064
	Okehampton	0.106	0.086	0.237	0.079
	Piacenza	0.043	0.074	0.203	0.047
	Porto	0.028	0.049	0.135	0.025
	Sevilla	<0.001	0.002	0.005	<0.001
	Thiva	0.002	0.064	0.170	0.002
Spring cereals	Châteaudun	0.012	0.053	0.144	0.009

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
	Hamburg	0.091	0.109	0.300	0.058
	Jokioinen	0.064	0.067	0.184	0.033
	Kremsmünster	0.078	0.085	0.233	0.066
	Okehampton	0.067	0.077	0.211	0.055
	Porto	0.012	0.039	0.109	0.015

Table A 28: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PEARL v4.4.4) Tier 2b

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 15 g a.s./ha	Châteaudun	0.034	0.506	0.056	0.062
	Hamburg	0.049	0.634	0.081	0.091
	Kremsmünster	0.049	0.442	0.057	0.096
	Okehampton	0.055	0.367	0.050	0.112
	Piacenza	0.031	0.534	0.047	0.063
	Porto	0.009	0.256	0.029	0.024
	Sevilla	<0.001	0.184	0.011	0.001
	Thiva	0.015	0.655	0.050	0.025
Maize 1 x 16 g a.s./ha	Châteaudun	0.037	0.540	0.060	0.067
	Hamburg	0.054	0.676	0.087	0.098
	Kremsmünster	0.053	0.472	0.061	0.103
	Okehampton	0.060	0.392	0.053	0.120
	Piacenza	0.033	0.570	0.050	0.068
	Porto	0.010	0.273	0.031	0.026
	Sevilla	<0.001	0.197	0.011	0.001
	Thiva	0.017	0.701	0.053	0.027
Maize 1 x 20 g a.s./ha	Châteaudun	0.049	0.678	0.075	0.087
	Hamburg	0.071	0.848	0.109	0.127
	Kremsmünster	0.071	0.591	0.077	0.134
	Okehampton	0.079	0.491	0.067	0.154
	Piacenza	0.045	0.718	0.062	0.088
	Porto	0.013	0.342	0.039	0.034
	Sevilla	<0.001	0.248	0.014	0.002
	Thiva	0.023	0.887	0.067	0.036
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.022	0.621	0.053	0.044
	Hamburg	0.076	0.745	0.092	0.140
	Jokioinen	0.025	0.713	0.088	0.058
	Kremsmünster	0.069	0.499	0.058	0.131
	Okehampton	0.083	0.427	0.058	0.160
	Piacenza	0.058	0.559	0.043	0.102
	Porto	0.026	0.382	0.039	0.056
	Sevilla	<0.001	0.101	0.010	<0.001
	Thiva	0.004	0.701	0.034	0.011
Spring cereals	Châteaudun	0.012	0.470	0.040	0.028

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	**CGA349707**	**CGA325025**	**SYN547308**
	Hamburg	0.065	0.829	0.103	0.122
	Jokioinen	0.027	0.580	0.074	0.062
	Kremsmünster	0.067	0.540	0.063	0.123
	Okehampton	0.057	0.403	0.053	0.114
	Porto	0.014	0.299	0.033	0.035

Table A 29: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PELMO v5.5.3) Tier 2b

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 15 g a.s./ha	Châteaudun	0.013	0.050	0.136	0.012
	Hamburg	0.037	0.056	0.155	0.022
	Kremsmünster	0.041	0.054	0.151	0.032
	Okehampton	0.063	0.059	0.165	0.043
	Piacenza	0.018	0.045	0.123	0.025
	Porto	0.005	0.026	0.075	0.007
	Sevilla	<0.001	0.005	0.015	<0.001
	Thiva	0.003	0.043	0.117	0.003
Maize 1 x 16 g a.s./ha	Châteaudun	0.014	0.054	0.147	0.013
	Hamburg	0.040	0.060	0.166	0.024
	Kremsmünster	0.044	0.058	0.162	0.035
	Okehampton	0.068	0.064	0.177	0.047
	Piacenza	0.02	0.048	0.132	0.026
	Porto	0.005	0.029	0.080	0.007
	Sevilla	<0.001	0.006	0.016	<0.001
	Thiva	0.003	0.047	0.128	0.003
Maize 1 x 20 g a.s./ha	Châteaudun	0.019	0.070	0.190	0.017
	Hamburg	0.051	0.077	0.211	0.031
	Kremsmünster	0.058	0.075	0.206	0.046
	Okehampton	0.086	0.083	0.228	0.061
	Piacenza	0.025	0.062	0.170	0.034
	Porto	0.007	0.037	0.103	0.009
	Sevilla	<0.001	0.008	0.022	<0.001
	Thiva	0.004	0.063	0.169	0.004
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.012	0.064	0.174	0.011
	Hamburg	0.093	0.102	0.280	0.073
	Jokioinen	0.056	0.064	0.177	0.029
	Kremsmünster	0.077	0.085	0.234	0.067
	Okehampton	0.126	0.083	0.230	0.081
	Piacenza	0.042	0.082	0.226	0.054
	Porto	0.030	0.048	0.132	0.028
	Sevilla	<0.001	0.004	0.010	<0.001
	Thiva	0.001	0.030	0.081	0.001
Spring cereals	Châteaudun	0.005	0.036	0.098	0.004

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
	Hamburg	0.035	0.064	0.178	0.024
	Jokioinen	0.058	0.053	0.145	0.023
	Kremsmünster	0.054	0.067	0.184	0.044
	Okehampton	0.057	0.061	0.168	0.041
	Porto	0.021	0.037	0.102	0.021

Table A 30: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PELMO v5.5.3) Tier 2b

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 15 g a.s./ha	Châteaudun	0.017	0.425	0.043	0.032
	Hamburg	0.025	0.423	0.052	0.056
	Kremsmünster	0.034	0.393	0.045	0.065
	Okehampton	0.041	0.312	0.044	0.088
	Piacenza	0.027	0.301	0.036	0.058
	Porto	0.007	0.224	0.025	0.019
	Sevilla	<0.001	0.168	0.01	0.001
	Thiva	0.006	0.434	0.034	0.012
Maize 1 x 16 g a.s./ha	Châteaudun	0.018	0.454	0.046	0.035
	Hamburg	0.027	0.451	0.055	0.061
	Kremsmünster	0.037	0.419	0.048	0.070
	Okehampton	0.044	0.332	0.046	0.094
	Piacenza	0.029	0.321	0.038	0.062
	Porto	0.008	0.239	0.027	0.021
	Sevilla	<0.001	0.180	0.011	0.001
	Thiva	0.006	0.463	0.036	0.013
Maize 1 x 20 g a.s./ha	Châteaudun	0.025	0.572	0.058	0.045
	Hamburg	0.036	0.562	0.069	0.078
	Kremsmünster	0.050	0.523	0.059	0.090
	Okehampton	0.058	0.414	0.058	0.121
	Piacenza	0.039	0.401	0.048	0.078
	Porto	0.010	0.299	0.033	0.026
	Sevilla	<0.001	0.227	0.013	0.001
	Thiva	0.008	0.584	0.045	0.017
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.015	0.534	0.045	0.033
	Hamburg	0.073	0.636	0.082	0.144
	Jokioinen	0.023	0.573	0.079	0.055
	Kremsmünster	0.072	0.514	0.061	0.147
	Okehampton	0.082	0.396	0.053	0.165
	Piacenza	0.057	0.613	0.050	0.109
	Porto	0.024	0.360	0.035	0.062
	Sevilla	<0.001	0.199	0.011	<0.001
	Thiva	0.001	0.397	0.020	0.004
Spring cereals	Châteaudun	0.006	0.372	0.030	0.016

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	**CGA349707**	**CGA325025**	**SYN547308**
	Hamburg	0.031	0.502	0.060	0.061
	Jokioinen	0.019	0.487	0.063	0.045
	Kremsmünster	0.047	0.437	0.050	0.087
	Okehampton	0.042	0.321	0.043	0.086
	Porto	0.015	0.262	0.030	0.041

Table A 31: PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PEARL v4.4.4) Tier 2c

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 15 g a.s./ha	Châteaudun	0.018	0.032	0.089	0.013
	Hamburg	0.040	0.037	0.104	0.020
	Kremsmünster	0.031	0.032	0.089	0.022
	Okehampton	0.042	0.031	0.088	0.028
	Piacenza	0.011	0.028	0.078	0.013
	Porto	0.003	0.014	0.039	0.003
	Sevilla	<0.001	0.002	0.006	<0.001
	Thiva	0.003	0.030	0.085	0.003
Maize 1 x 16 g a.s./ha	Châteaudun	0.020	0.034	0.096	0.014
	Hamburg	0.044	0.040	0.111	0.022
	Kremsmünster	0.033	0.034	0.095	0.024
	Okehampton	0.045	0.034	0.095	0.031
	Piacenza	0.012	0.030	0.084	0.014
	Porto	0.004	0.015	0.042	0.004
	Sevilla	<0.001	0.002	0.006	<0.001
	Thiva	0.003	0.033	0.092	0.004
Maize 1 x 20 g a.s./ha	Châteaudun	0.026	0.045	0.124	0.019
	Hamburg	0.058	0.052	0.143	0.028
	Kremsmünster	0.043	0.044	0.122	0.031
	Okehampton	0.058	0.044	0.122	0.040
	Piacenza	0.016	0.039	0.108	0.018
	Porto	0.005	0.019	0.054	0.005
	Sevilla	<0.001	0.003	0.008	<0.001
	Thiva	0.004	0.043	0.120	0.005
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.009	0.032	0.089	0.007
	Hamburg	0.050	0.048	0.134	0.031
	Jokioinen	0.028	0.031	0.087	0.014
	Kremsmünster	0.035	0.038	0.107	0.028
	Okehampton	0.050	0.043	0.120	0.042
	Piacenza	0.025	0.033	0.092	0.026
	Porto	0.014	0.025	0.069	0.014
	Sevilla	<0.001	<0.001	0.003	<0.001
	Thiva	<0.001	0.025	0.070	<0.001
Spring cereals	Châteaudun	0.005	0.023	0.065	0.004

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
	Hamburg	0.044	0.048	0.135	0.027
	Jokioinen	0.030	0.030	0.086	0.014
	Kremsmünster	0.035	0.039	0.111	0.030
	Okehampton	0.034	0.035	0.097	0.027
	Porto	0.007	0.018	0.051	0.007

Table A 32: PEC_{GW} for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PEARL v4.4.4) Tier 2c

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 15 g a.s./ha	Châteaudun	0.015	0.251	0.029	0.032
	Hamburg	0.022	0.290	0.039	0.045
	Kremsmünster	0.021	0.224	0.028	0.044
	Okehampton	0.023	0.180	0.026	0.050
	Piacenza	0.013	0.243	0.023	0.028
	Porto	0.003	0.121	0.014	0.011
	Sevilla	<0.001	0.085	0.005	<0.001
	Thiva	0.006	0.344	0.027	0.014
Maize 1 x 16 g a.s./ha	Châteaudun	0.016	0.268	0.031	0.034
	Hamburg	0.023	0.310	0.042	0.048
	Kremsmünster	0.023	0.240	0.030	0.048
	Okehampton	0.025	0.192	0.028	0.054
	Piacenza	0.014	0.260	0.025	0.030
	Porto	0.004	0.129	0.015	0.012
	Sevilla	<0.001	0.091	0.006	<0.001
	Thiva	0.006	0.368	0.029	0.015
Maize 1 x 20 g a.s./ha	Châteaudun	0.022	0.337	0.038	0.044
	Hamburg	0.031	0.388	0.053	0.062
	Kremsmünster	0.030	0.300	0.038	0.062
	Okehampton	0.033	0.240	0.035	0.069
	Piacenza	0.019	0.326	0.031	0.038
	Porto	0.005	0.163	0.019	0.016
	Sevilla	<0.001	0.114	0.007	<0.001
	Thiva	0.009	0.466	0.036	0.020
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.009	0.305	0.027	0.020
	Hamburg	0.033	0.352	0.044	0.069
	Jokioinen	0.011	0.335	0.042	0.027
	Kremsmünster	0.032	0.262	0.030	0.061
	Okehampton	0.037	0.216	0.028	0.081
	Piacenza	0.027	0.269	0.023	0.057
	Porto	0.012	0.195	0.020	0.031
	Sevilla	<0.001	0.075	0.005	<0.001
	Thiva	0.001	0.357	0.019	0.004
Spring cereals	Châteaudun	0.005	0.235	0.020	0.014

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
	Hamburg	0.028	0.381	0.048	0.059
	Jokioinen	0.012	0.291	0.038	0.028
	Kremsmünster	0.030	0.290	0.033	0.062
	Okehampton	0.025	0.202	0.028	0.055
	Porto	0.006	0.146	0.018	0.017

Table A 33: **PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406 (with FOCUS PELMO v5.5.3) Tier 2c**

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 15 g a.s./ha	Châteaudun	0.006	0.022	0.062	0.006
	Hamburg	0.015	0.025	0.073	0.009
	Kremsmünster	0.021	0.026	0.073	0.015
	Okehampton	0.036	0.026	0.074	0.023
	Piacenza	0.012	0.020	0.057	0.015
	Porto	0.002	0.011	0.031	0.003
	Sevilla	<0.001	0.002	0.006	<0.001
	Thiva	0.001	0.019	0.053	0.002
Maize 1 x 16 g a.s./ha	Châteaudun	0.006	0.024	0.067	0.007
	Hamburg	0.017	0.028	0.078	0.009
	Kremsmünster	0.023	0.028	0.078	0.016
	Okehampton	0.039	0.028	0.080	0.025
	Piacenza	0.013	0.022	0.062	0.016
	Porto	0.003	0.012	0.034	0.003
	Sevilla	<0.001	0.002	0.006	<0.001
	Thiva	0.001	0.021	0.057	0.002
Maize 1 x 20 g a.s./ha	Châteaudun	0.008	0.031	0.088	0.009
	Hamburg	0.022	0.036	0.101	0.012
	Kremsmünster	0.029	0.036	0.101	0.021
	Okehampton	0.050	0.037	0.103	0.032
	Piacenza	0.016	0.029	0.080	0.021
	Porto	0.003	0.015	0.044	0.004
	Sevilla	<0.001	0.003	0.009	<0.001
	Thiva	0.001	0.027	0.075	0.002
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.006	0.027	0.076	0.005
	Hamburg	0.057	0.048	0.132	0.033
	Jokioinen	0.029	0.028	0.079	0.013
	Kremsmünster	0.035	0.039	0.110	0.030
	Okehampton	0.059	0.041	0.115	0.043
	Piacenza	0.032	0.038	0.107	0.028
	Porto	0.017	0.024	0.066	0.015
	Sevilla	<0.001	0.002	0.004	<0.001
	Thiva	<0.001	0.011	0.030	<0.001
Spring cereals	Châteaudun	0.002	0.015	0.042	0.002

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
	Hamburg	0.016	0.029	0.081	0.011
	Jokioinen	0.026	0.024	0.067	0.010
	Kremsmünster	0.027	0.030	0.084	0.019
	Okehampton	0.029	0.028	0.078	0.019
	Porto	0.012	0.018	0.050	0.011

Table A 34: **PEC_{GW} for SYN542604, CGA349707, CGA325025 and SYN547308 (with FOCUS PELMO v5.5.3) Tier 2c**

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	**CGA349707**	**CGA325025**	**SYN547308**
Maize 1 x 15 g a.s./ha	Châteaudun	0.008	0.208	0.021	0.015
	Hamburg	0.012	0.202	0.027	0.026
	Kremsmünster	0.015	0.200	0.023	0.034
	Okehampton	0.017	0.154	0.022	0.040
	Piacenza	0.012	0.150	0.017	0.028
	Porto	0.003	0.105	0.012	0.009
	Sevilla	<0.001	0.076	0.004	<0.001
	Thiva	0.002	0.214	0.016	0.006
Maize 1 x 16 g a.s./ha	Châteaudun	0.008	0.222	0.022	0.017
	Hamburg	0.013	0.215	0.028	0.028
	Kremsmünster	0.016	0.213	0.025	0.036
	Okehampton	0.019	0.164	0.024	0.043
	Piacenza	0.013	0.160	0.018	0.030
	Porto	0.003	0.112	0.013	0.009
	Sevilla	<0.001	0.081	0.005	<0.001
	Thiva	0.002	0.229	0.017	0.007
Maize 1 x 20 g a.s./ha	Châteaudun	0.011	0.279	0.028	0.022
	Hamburg	0.017	0.269	0.035	0.036
	Kremsmünster	0.021	0.267	0.031	0.047
	Okehampton	0.025	0.205	0.029	0.056
	Piacenza	0.018	0.200	0.023	0.039
	Porto	0.004	0.140	0.016	0.012
	Sevilla	<0.001	0.102	0.006	<0.001
	Thiva	0.003	0.289	0.021	0.009
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.006	0.264	0.023	0.014
	Hamburg	0.030	0.314	0.041	0.070
	Jokioinen	0.009	0.297	0.040	0.025
	Kremsmünster	0.032	0.266	0.032	0.063
	Okehampton	0.038	0.198	0.026	0.083
	Piacenza	0.029	0.301	0.027	0.056
	Porto	0.012	0.179	0.018	0.030
	Sevilla	<0.001	0.088	0.006	<0.001
	Thiva	<0.001	0.201	0.010	0.001
Spring cereals	Châteaudun	0.003	0.181	0.015	0.007

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
	Hamburg	0.013	0.248	0.031	0.029
	Jokioinen	0.008	0.240	0.031	0.021
	Kremsmünster	0.019	0.219	0.027	0.042
	Okehampton	0.018	0.159	0.022	0.041
	Porto	0.007	0.125	0.015	0.022

Table A 35: PEC_{GW} for prosulfuron, CGA150829, CGA159902, CGA300406 (with MACRO v5.5.4) Tier 1

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
Maize 1 x 15 g a.s./ha	Châteaudun	0.267	0.032	0.134	0.040
Maize 1 x 16 g a.s./ha	Châteaudun	0.287	0.034	0.144	0.043
Maize 1 x 20 g a.s./ha	Châteaudun	0.367	0.044	0.184	0.055
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.291	0.044	0.192	0.049
Spring cereals 1 x 15 g a.s./ha	Châteaudun	0.251	0.034	0.147	0.038

Table A 36: PEC_{GW} for SYN542604, CGA349707, CGA325025 and SYN547308 (with MACRO v5.5.4) Tier 1

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 15 g a.s./ha	Châteaudun	0.023	0.320	0.034	0.062
Maize 1 x 16 g a.s./ha	Châteaudun	0.025	0.341	0.036	0.066
Maize 1 x 20 g a.s./ha	Châteaudun	0.033	0.426	0.045	0.085
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.030	0.451	0.044	0.077
Spring cereals 1 x 15 g a.s./ha	Châteaudun	0.024	0.351	0.033	0.063

Table A 37: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with MACRO v5.5.4) Tier 2a

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
Maize 1 x 15 g a.s./ha	Châteaudun	0.010	0.024	0.119	0.009
Maize 1 x 16 g a.s./ha	Châteaudun	0.010	0.026	0.129	0.010
Maize 1 x 20 g a.s./ha	Châteaudun	0.014	0.035	0.168	0.013
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.006	0.026	0.141	0.007
Spring cereals 1 x 15 g a.s./ha	Châteaudun	0.004	0.021	0.111	0.005

Table A 38: PEC$_{GW}$ for SYN542604, CGA349707, CGA325025 and SYN547308 (with MACRO v5.5.4) Tier 2a

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		SYN542604	**CGA349707**	**CGA325025**	**SYN547308**
Maize 1 x 15 g a.s./ha	Châteaudun	0.003	0.335	0.029	0.020
Maize 1 x 16 g a.s./ha	Châteaudun	0.004	0.358	0.031	0.022
Maize 1 x 20 g a.s./ha	Châteaudun	0.005	0.450	0.038	0.029
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.003	0.407	0.032	0.018
Spring cereals 1 x 15 g a.s./ha	Châteaudun	0.002	0.321	0.024	0.013

Table A 39: PEC$_{GW}$ for prosulfuron, CGA150829, CGA159902, CGA300406 (with MACRO v5.5.4) Tier 2b

Crop	Scenario	80th Percentile PEC$_{GW}$ at 1 m Soil Depth (µg/L)			
		Prosulfuron	**CGA150829**	**CGA159902**	**CGA300406**
Maize 1 x 15 g a.s./ha	Châteaudun	0.015	0.047	0.128	0.010
Maize 1 x 16 g a.s./ha	Châteaudun	0.016	0.051	0.138	0.011
Maize 1 x 20 g a.s./ha	Châteaudun	0.022	0.067	0.180	0.015
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.010	0.057	0.155	0.010
Spring cereals	Châteaudun	0.007	0.044	0.120	0.007

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		Prosulfuron	CGA150829	CGA159902	CGA300406
1 x 15 g a.s./ha					

Table A 40: PEC_{GW} for SYN542604, CGA349707, CGA325025 and SYN547308 (with MACRO v5.5.4) Tier 2b

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)			
		SYN542604	CGA349707	CGA325025	SYN547308
Maize 1 x 15 g a.s./ha	Châteaudun	0.005	0.337	0.029	0.031
Maize 1 x 16 g a.s./ha	Châteaudun	0.006	0.360	0.031	0.033
Maize 1 x 20 g a.s./ha	Châteaudun	0.008	0.452	0.039	0.043
Winter cereals 1 x 15 g a.s./ha	Châteaudun	0.005	0.418	0.035	0.029
Spring cereals 1 x 15 g a.s./ha	Châteaudun	0.004	0.326	0.025	0.022

A 3.4 De Vries, K (2016a): Prosulfuron - A European Environmental Fate Assessment for Parent Using the FOCUS Surface Water Models at Steps 3 to 4 Following Spray Application to Maize and Cereals in the EU

Comments of zRMS:	The submitted report for PECsw/sed assessment was not accepted, as the incorrect endpoints were used in PECsw/sed assessment. PUF = 0.5 was not accepted.

Reference: KCP 9.2.5 / 01

Report: Prosulfuron - A European Environmental Fate Assessment for Parent Using the FOCUS Surface Water Models at Steps 3 to 4 Following Spray Application to Maize and Cereals in the EU, De Vries, K (2016), Dr. Knoell Consult GmbH, Mannheim, Germany, Report No 103276-1. (Syngenta File No CGA152005_10806)

Guideline(s): Yes:
FOCUS (2001). FOCUS Surface Water Scenarios in the EU Evaluation Process under 91/414/EEC. Report of the FOCUS Working Group on Surface Water Scenarios, EC Document Reference SANCO/4802/2001 rev. 2.

FOCUS (2007). Landscape and Mitigation Factors In Aquatic Ecological Risk Assessment. Volume 1. Extended Summary and Recommendations, The Final Report of the FOCUS Working Group on Landscape and Mitigation Factors in Ecological Risk Assessment, EC Document Reference Sanco/10422/2005, version 2.0, September 2007.

FOCUS (2015). Generic Guidance for FOCUS Surface Water Scenarios, version 1.4.

Deviations: No

GLP: Not applicable

Acceptability: Yes/No/Supplementary

A 3.4.1 Materials and methods

This report describes a FOCUS modelling study that examined the potential for prosulfuron to reach surface water following foliar application to maize, spring cereals and winter cereals. The FOCUS tool SWASH (v 5.3), including the operational models FOCUS-MACRO (v 5.5.4), FOCUS-PRZM (v 4.3.1) and FOCUS-TOXSWA (v 4.4.3), were used in the modelling study for Step 3 simulations. The ECPA tool SWAN (v 4.0.1) was used to implement mitigation options at Step 4.

Single, foliar applications each at a rate of 16 g a.s./ha and 20 g a.s./ha from approximately growth stage BBCH 12 for maize were considered. For winter and spring cereals, single, foliar applications each at a rates of 15 g a.s./ha from approximately growth stage BBCH 21 were considered. The input parameters relating to application are shown below.

Table A 41: Input parameters related to application for PECsw/sed calculations

Use No	1	2	3	4
Crop	Maize	Maize	Winter cereals	Spring cereals
Application rate (g as/ha)	16	20	15	15

Number of applications/interval (d)	1/-	1/-	1/-	1/-
Application method	Foliar spray			
CAM (Chemical application method)	2 (application foliar linear)			
Soil depth (cm)	4			
Models used for calculation	FOCUS SWASH v5.3, FOCUS PRZM v4.3.1, FOCUS MACRO v5.5.4, FOCUS TOXWA v4.4.1 SWAN 4.0.1			

Ground spray application (foliar spray) was considered as the application method in all simulations. Crop interception at Step 3 is calculated internally by the model on the basis of the maximum interception capacity and the actual leaf area index.

An application window has to be specified from which the Pesticide Application Timer (PAT), internal to the model, determines actual application dates which were set generically for all scenarios. Application window dates are presented in Table 2, below. The dates were selected with the tool AppDate (v2.0bSE) based on BBCH growth stages given in the recommended GAP. Simulations were carried out using the FOCUS standard crops maize, winter cereals and spring cereals

The application windows used for each scenario are shown in Table A 42 below.

Table A 42: FOCUS Step 3 Scenario related input parameters for PECsw/sed calculations for the application of prosulfuron

Crop	Scenario	Prosulfuron	
		Application window used in modelling	
		Start of Window	End of Window
Maize Use No1, 2	D3	8-May (128)	7-Jun (158)
	D4	13-May (133)	12-Jun (163)
	D5	13-May (133)	12-Jun (163)
	D6	23-Apr (113)	23-May (143)
	R1	6-May (126)	5-Jun (156)
	R2	4-May (124)	3-Jun (154)
	R3	4-May (124)	3-Jun (154)
	R4	13-Apr (103)	13-May (133)
Winter cereals[a] Use No3	D1	1-Apr (91)	1-May (121)
	D2	1-Mar (60)	31-Mar (90)
	D3	1-Mar (60)	31-Mar (90)
	D4	1-Apr (91)	1-May (121)
	D5	1-Mar (60)	31-Mar (90)
	D6	1-Mar (60)	31-Mar (90)
	R1	1-Mar (60)	31-Mar (90)
	R3	1-Mar (60)	31-Mar (90)

Crop	Scenario	Prosulfuron	
		Application window used in modelling	
		Start of Window	End of Window
	R4	1-Mar (60)	31-Mar (90)
Spring cereals Use No 4	D1	12-May (132)	11-Jun (162)
	D3	8-Apr (98)	8-May (128)
	D4	3-May (123)	2-Jun (153)
	D5	22-Mar (81)	21-Apr (111)
	R4	22-Mar (81)	21-Apr (111)

Numbers in brackets are the corresponding 'Julian Day' numbers
[a] For winter cerals fixed dates were used

Due to the statistical nature of the drift implementation at Step 3 (FOCUS 2001, 2015), the loading to the water body for a single application is higher than the loading from an individual event from a multiple application pattern, which can therefore generate a higher global maximum PEC_{sw} value. All values are presented but where the single application results in a higher instantaneous PEC, this is highlighted in the summary table.

Step 4 calculations were carried out for those scenarios which require mitigation with the following mitigation methods:

- spray drift and run off reduction by a non-sprayed and vegetated buffer stripe of 10m and 20m using runoff and erosion reduction values as given by the FOCUS Working Group on Landscape and Mitigation Factors (2007) – runoff/erosion reduction of 60/80% for 10m and 90/95% for 20m.

A conservative prosulfuron laboratory degradation rate of 62.1 days was used for Tier 1. For Tier 2 field dissipation studies value of 20.8 days was considered.

Table A 43: Input parameters related to active substance prosulfuron for PECsw/sed calculations

Compound	Prosulfuron	Value in accordance to EU endpoint / Reference
Molar mass (g/mol)	419.4	Yes / EFSA, 2014
Water solubility (mg/L)	4000 (25°C)	Yes / EFSA, 2014
Saturated vapour pressure (Pa)	0 (20°C)	Worst case used for modelling, → worst case EFSA, 2014
Diffusion coefficient in water (m²/d)	4.3×10^{-5}	FOCUS default
Diffusion coefficient in air (m²/d)	0.43	FOCUS default
K_{foc} (mL/g)	11.7 (geomean, n = 8)	Yes / EFSA, 2014
Freundlich Exponent	0.87 (arithmetic mean, n = 8)	Yes /

Compound	Prosulfuron	Value in accordance to EU endpoint / Reference
1/n		EFSA, 2014
Plant Uptake	0.5	Default value for systemic compounds
Wash-Off factor from Crop (1/mm)	0.05 (MACRO) 0.50 (PRZM)	FOCUS default
$DT_{50,soil}$ (d), laboratory, Tier 1	62.1 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n =10)	Yes / EFSA, 2014
$DT_{50,soil}$ (d), field, Tier 2	20.8 (geomean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.58, n =6)	No / Hardy & Jastrzebski (2015)
$DT_{50,water}$ (d)	(whole system) 173(geomean, n = 4)	Yes / EFSA, 2014
$DT_{50,sed}$ (d)	1000	Default value
$DT_{50,whole\ system}$ (d)	173 (geomean, n = 4)	Yes / EFSA, 2014

A 3.4.2 Results

Predicted environmental concentrations in surface water (PEC_{sw}) and sediment (PEC_{sed}) were calculated for the use of prosulfuron on maize, winter cereals and spring cereals in Europe in accordance with FOCUS guidelines.

The results are presented in the tables below in the following order:

FOCUS Step 3 Global Maximum PEC_{sw} and PEC_{sed} for prosulfuron following single application to maize, to winter cereals and to spring cereals.

FOCUS Application dates and global maximum timing

FOCUS Step 3 Time Weighted Average for prosulfuron following single application to maize, to winter cereals and to spring cereals

FOCUS Step 4 Global Maximum PECsw for prosulfuron following single application to maize, to winter cereals and to spring cereals.

FOCUS Step 4 Global Maximum PECsed for prosulfuron following single application to maize, to winter cereals and to spring cereals.

Table A 44: FOCUS Step 3 Global Maximum PECsw and PECsed for prosulfuron following single application to maize (Tier 1)

Application scenario	Scenario	Waterbody	PEC_{sw} (µg/L)	Dominant Route of Entry	7 d-PECsw,twa (µg/L)	PEC_{sed} (µg/kg)
Maize 1 x 16 g a.s./ha	D3	Ditch	0.289	Drift	0.220	0.414
	D4	Pond	0.376	Drainage	0.375	0.570
	D4	Stream	0.189	Drainage	0.181	0.248
	D5	Pond	0.156	Drainage	0.156	0.257
	D5	Stream	0.117	Drift	0.072	0.083
	D6	Ditch	0.097	Drift	0.036	0.056
	R1	Pond	0.006	Runoff	0.005	0.006
	R1	Stream	0.172	Runoff	0.011	0.013
	R2	Stream	0.547	Runoff	0.049	0.063
	R3	Stream	0.651	Runoff	0.062	0.065
	R4	Stream	0.796	Runoff	0.090	0.097
Maize 1 x 20 g a.s./ha	D3	Ditch	0.368	Drift	0.282	0.520
	D4	Pond	0.478	Drainage	0.477	0.714
	D4	Stream	0.240	Drainage	0.230	0.310
	D5	Pond	0.200	Drainage	0.199	0.324
	D5	Stream	0.148	Drift	0.093	0.104
	D6	Ditch	0.122	Drift	0.046	0.070
	R1	Pond	0.007	Runoff	0.007	0.007
	R1	Stream	0.214	Runoff	0.013	0.016
	R2	Stream	0.687	Runoff	0.062	0.078
	R3	Stream	0.812	Runoff	0.077	0.080
	R4	Stream	0.996	Runoff	0.112	0.121

Table A 45: FOCUS Step 3 Global Maximum PECsw and PECsed for prosulfuron following single application to winter cereals and spring cereals (Tier 1)

Application scenario	Scenario	Waterbody	PEC_{sw} (µg/L)	Dominant Route of Entry	7 d-PECsw,twa (µg/L)	PEC_{sed} (µg/kg)
Winter cereals 1 x 15 g a.s./ha	D1	Ditch	2.16	Drainage	1.80	1.11
	D1	Stream	1.35	Drainage	1.10	0.573
	D2	Ditch	2.25	Drainage	1.29	0.677
	D2	Stream	1.43	Drainage	0.722	0.401
	D3	Ditch	0.235	Drift	0.151	0.283
	D4	Pond	0.271	Drainage	0.271	0.416
	D4	Stream	0.170	Drift	0.133	0.173
	D5	Pond	0.104	Drainage	0.104	0.170
	D5	Stream	0.105	Drift	0.047	0.050
	D6	Ditch	0.119	Drift	0.039	0.038
	R1	Pond	0.009	Runoff	0.009	0.010
	R1	Stream	0.279	Runoff	0.021	0.028
	R3	Stream	0.614	Runoff	0.056	0.065
	R4	Stream	0.063	Drift	0.002	0.004
Spring cereals 1 x 15 g a.s./ha	D1	Ditch	0.454	Drainage	0.439	0.401
	D1	Stream	0.293	Drainage	0.267	0.233
	D3	Ditch	0.270	Drift	0.188	0.344
	D4	Pond	0.325	Drainage	0.325	0.505
	D4	Stream	0.160	Drift	0.150	0.218
	D5	Pond	0.109	Drainage	0.108	0.177
	D5	Stream	0.106	Drift	0.046	0.050
	R4	Stream	0.062	Drift	0.002	0.004

Table A 46: FOCUS Step 3 Global Maximum PECsw and PECsed for prosulfuron following single application to maize (Tier 2)

Application scenario	Scenario	Waterbody	PEC_{sw} (µg/L)	Dominant Route of Entry	7 d-PECsw,twa (µg/L)	PEC_{sed} (µg/kg)
Maize 1 x 16 g a.s./ha	D3	Ditch	0.093	Drift	0.023	0.028
	D4	Pond	0.024	Drainage	0.024	0.043
	D4	Stream	0.075	Drift	0.014	0.017
	D5	Pond	0.012	Drift	0.012	0.020
	D5	Stream	0.077	Drift	0.006	0.009
	D6	Ditch	0.085	Drift	0.014	0.012
	R1	Pond	0.005	Runoff	0.005	0.006
	R1	Stream	0.168	Runoff	0.010	0.013
	R2	Stream	0.504	Runoff	0.045	0.058
	R3	Stream	0.618	Runoff	0.058	0.061
	R4	Stream	0.768	Runoff	0.087	0.094
Maize 1 x 20 g a.s./ha	D3	Ditch	0.117	Drift	0.030	0.035
	D4	Pond	0.031	Drainage	0.031	0.054
	D4	Stream	0.095	Drift	0.018	0.021
	D5	Pond	0.015	Drift	0.015	0.026
	D5	Stream	0.097	Drift	0.007	0.011
	D6	Ditch	0.106	Drift	0.018	0.015
	R1	Pond	0.007	Runoff	0.006	0.007
	R1	Stream	0.210	Runoff	0.013	0.016
	R2	Stream	0.633	Runoff	0.057	0.072
	R3	Stream	0.771	Runoff	0.073	0.076
	R4	Stream	0.962	Runoff	0.108	0.117

Table A 47: FOCUS Step 3 Global Maximum PECsw and PECsed for prosulfuron following single application to winter cereals and spring cereals (Tier 2)

Application scenario	Scenario	Waterbody	PEC_{sw} (µg/L)	Dominant Route of Entry	7 d-PECsw,twa (µg/L)	PEC_{sed} (µg/kg)
Winter cereals 1 x 15 g a.s./ha	D1	Ditch	1.99	Drainage	1.64	0.920
	D1	Stream	1.25	Drainage	1.00	0.462
	D2	Ditch	2.10	Drainage	1.17	0.556
	D2	Stream	1.33	Drainage	0.650	0.324
	D3	Ditch	0.099	Drift	0.014	0.015
	D4	Pond	0.016	Drainage	0.016	0.030

Application scenario	Scenario	Waterbody	PEC_{sw} (µg/L)	Dominant Route of Entry	7 d-PECsw,twa (µg/L)	PEC_{sed} (µg/kg)
	D4	Stream	0.077	Drift	0.009	0.011
	D5	Pond	0.006	Drift	0.006	0.009
	D5	Stream	0.076	Drift	0.002	0.004
	D6	Ditch	0.103	Drift	0.023	0.020
	R1	Pond	0.009	Runoff	0.009	0.010
	R1	Stream	0.269	Runoff	0.020	0.027
	R3	Stream	0.599	Runoff	0.055	0.063
	R4	Stream	0.063	Drift	0.002	0.004
Spring cereals 1 x 15 g a.s./ha	D1	Ditch	0.293	Drainage	0.280	0.208
	D1	Stream	0.192	Drainage	0.171	0.113
	D3	Ditch	0.101	Drift	0.020	0.022
	D4	Pond	0.021	Drainage	0.021	0.038
	D4	Stream	0.081	Drift	0.012	0.015
	D5	Pond	0.006	Drift	0.006	0.009
	D5	Stream	0.076	Drift	0.001	0.004
	R4	Stream	0.062	Drift	0.002	0.004

Table A 48: FOCUS Application dates and global maximum timing

Application scenario	Scenario	Water body	Application date	Date of global maximum (Tier 1)	Date of global maximum (Tier 2)
Maize 1 x 16 g a.s./ha 1 x 20 g a.s./ha	D3	Ditch	14-May-92	14-May-92	14-May-92
	D4	Pond	30-May-85	2-Feb-86	30-Jan-86
	D4	Stream	30-May-85	18-Dec-85	30-May-85
	D5	Pond	27-May-78	18-Feb-79	27-May-78
	D5	Stream	27-May-78	27-May-78	27-May-78
	D6	Ditch	23-Apr-86	23-Apr-86	23-Apr-86
	R1	Pond	9-May-84	20-May-84	20-May-84
	R1	Stream	09-May-84	14-May-84	14-May-84
	R2	Stream	7-May-77	13-May-77	13-May-77
	R3	Stream	18-May-80	23-May-80	23-May-80
	R4	Stream	13-Apr-84	18-Apr-84	18-Apr-84
Winter cereals 1 x 15 g a.s./ha	D1	Ditch	1-Apr-82	9-Apr-82	9-Apr-82
	D1	Stream	1-Apr-82	9-Apr-82	9-Apr-82
	D2	Ditch	12-Mar-86	23-Mar-86	23-Mar-86

Application scenario	Scenario	Water body	Application date	Date of global maximum (Tier 1)	Date of global maximum (Tier 2)
	D2	Stream	12-Mar-86	23-Mar-86	23-Mar-86
	D3	Ditch	29-Feb-92	29-Feb-92	29-Feb-92
	D4	Pond	18-Apr-85	4-Feb-86	31-Jan-86
	D4	Stream	18-Apr-85	18-Apr-85	18-Apr-85
	D5	Pond	7-Mar-78	17-Feb-79	7-Mar-78
	D5	Stream	7-Mar-78	7-Mar-78	7-Mar-78
	D6	Ditch	5-Mar-86	5-Mar-86	5-Mar-86
	R1	Pond	17-Mar-84	1-Apr-84	1-Apr-84
	R1	Stream	17-Mar-84	1-Apr-84	1-Apr-84
	R3	Stream	1-Mar-80	8-Mar-80	8-Mar-80
	R4	Stream	5-Mar-84	5-Mar-84	5-Mar-84
Spring cereals 1 x 15 g a.s./ha	D1	Ditch	14-May-82	28-May-82	28-May-82
	D1	Stream	14-May-82	26-May-82	26-May-82
	D3	Ditch	07-Apr-92	7-Apr-92	7-Apr-92
	D4	Pond	30-May-85	2-Feb-86	31-Jan-86
	D4	Stream	30-May-85	1-Jan-85	30-May-85
	D5	Pond	8-Apr-78	17-Feb-79	8-Apr-78
	D5	Stream	8-Apr-78	8-Apr-78	8-Apr-78
	R4	Stream	22-Mar-84	22-Mar-84	22-Mar-84

Table A 49: FOCUS Step 3 Time Weighted Average for prosulfuron following single application to maize (Tier 1)

Application scenario	**Scenario**	**Water body**	**Max TWAEC$_{sw}$**		
			7 day	21 day	28 day
Maize 1 x 16 g a.s./ha	D3	Ditch	0.220	0.219	0.219
	D4	Pond	0.375	0.372	0.370
	D4	Stream	0.181	0.167	0.161
	D5	Pond	0.156	0.153	0.152
	D5	Stream	0.072	0.065	0.063
	D6	Ditch	0.036	0.030	0.029
	R1	Pond	0.005	0.005	0.005
	R1	Stream	0.011	0.004	0.003
	R2	Stream	0.049	0.016	0.012
	R3	Stream	0.062	0.022	0.016
	R4	Stream	0.090	0.032	0.024
Maize 1 x 20 g a.s./ha	D3	Ditch	0.282	0.280	0.280
	D4	Pond	0.477	0.474	0.471
	D4	Stream	0.230	0.211	0.204
	D5	Pond	0.199	0.197	0.195
	D5	Stream	0.093	0.084	0.081
	D6	Ditch	0.046	0.038	0.037
	R1	Pond	0.007	0.006	0.006
	R1	Stream	0.013	0.005	0.004
	R2	Stream	0.062	0.021	0.015
	R3	Stream	0.077	0.027	0.020
	R4	Stream	0.112	0.040	0.030

Table A 50: FOCUS Step 3 Time Weighted Average for prosulfuron following single application to winter cereals and spring cereals (Tier 1)

Application scenario	**Scenario**	**Water body**	**Max TWAEC$_{sw}$**		
			7 day	**21 day**	**28 day**
Winter cereals 1 x 15 g a.s./ha	D1	Ditch	1.80	1.42	1.30
	D1	Stream	1.10	0.805	0.636
	D2	Ditch	1.29	0.958	0.903
	D2	Stream	0.722	0.519	0.499
	D3	Ditch	0.151	0.144	0.143
	D4	Pond	0.271	0.269	0.268
	D4	Stream	0.133	0.124	0.119

Application scenario	Scenario	Water body	Max $TWAEC_{sw}$		
			7 day	21 day	28 day
	D5	Pond	0.104	0.102	0.101
	D5	Stream	0.047	0.038	0.036
	D6	Ditch	0.039	0.030	0.029
	R1	Pond	0.009	0.008	0.008
	R1	Stream	0.021	0.008	0.006
	R3	Stream	0.056	0.020	0.015
	R4	Stream	0.002	0.001	0.000
Spring cereals 1 x 15 g a.s./ha	D1	Ditch	0.439	0.383	0.352
	D1	Stream	0.267	0.188	0.166
	D3	Ditch	0.188	0.179	0.178
	D4	Pond	0.325	0.323	0.321
	D4	Stream	0.150	0.139	0.135
	D5	Pond	0.108	0.106	0.105
	D5	Stream	0.046	0.038	0.037
	R4	Stream	0.002	< 0.001	< 0.001

Table A 51: FOCUS Step 3 Time Weighted Average for prosulfuron following single application to maize (Tier 2)

Application scenario	Scenario	Water body	Max $TWAEC_{sw}$		
			7 day	21 day	28 day
Maize 1 x 16 g a.s./ha	D3	Ditch	0.023	0.014	0.013
	D4	Pond	0.024	0.024	0.023
	D4	Stream	0.014	0.013	0.012
	D5	Pond	0.012	0.011	0.011
	D5	Stream	0.006	0.006	0.005
	D6	Ditch	0.014	0.005	0.004
	R1	Pond	0.005	0.005	0.005
	R1	Stream	0.010	0.004	0.003
	R2	Stream	0.045	0.015	0.011
	R3	Stream	0.058	0.021	0.016
	R4	Stream	0.087	0.031	0.023
Maize 1 x 20 g a.s./ha	D3	Ditch	0.030	0.018	0.016
	D4	Pond	0.031	0.031	0.030
	D4	Stream	0.018	0.016	0.015
	D5	Pond	0.015	0.014	0.014
	D5	Stream	0.007	0.007	0.007

Application scenario	Scenario	Water body	Max $TWAEC_{sw}$		
			7 day	21 day	28 day
	D6	Ditch	0.018	0.006	0.005
	R1	Pond	0.006	0.006	0.006
	R1	Stream	0.013	0.005	0.004
	R2	Stream	0.057	0.019	0.014
	R3	Stream	0.073	0.026	0.019
	R4	Stream	0.108	0.039	0.029

Table A 52: FOCUS Step 3 Time Weighted Average for prosulfuron following single application to winter cereals and spring cereals (Tier 2)

Application scenario	Scenario	Water body	Max $TWAEC_{sw}$		
			7 day	21 day	28 day
Winter cereals 1 x 15 g a.s./ha	D1	Ditch	1.64	1.27	1.16
	D1	Stream	1.00	0.717	0.556
	D2	Ditch	1.17	0.842	0.781
	D2	Stream	0.650	0.451	0.428
	D3	Ditch	0.014	0.007	0.006
	D4	Pond	0.016	0.016	0.016
	D4	Stream	0.009	0.008	0.008
	D5	Pond	0.006	0.006	0.006
	D5	Stream	0.002	0.002	0.001
	D6	Ditch	0.023	0.013	0.011
	R1	Pond	0.009	0.008	0.008
	R1	Stream	0.020	0.007	0.005
	R3	Stream	0.055	0.020	0.015
	R4	Stream	0.002	< 0.001	< 0.001
Spring cereals 1 x 15 g a.s./ha	D1	Ditch	0.280	0.241	0.221
	D1	Stream	0.171	0.107	0.087
	D3	Ditch	0.020	0.011	0.010
	D4	Pond	0.021	0.021	0.021
	D4	Stream	0.012	0.011	0.010
	D5	Pond	0.006	0.005	0.005
	D5	Stream	0.001	0.001	0.001
	R4	Stream	0.002	< 0.001	< 0.001

Table A 53: FOCUS Step 4 Global Maximum PECsw for prosulfuron following single application to maize (Tier 1)

Mitigation options						
Vegetative strip (m)			**10-12**		**18-20**	
No spray buffer (m)			**10**		**20**	
Nozzle reduction (%)			**-**		**-**	
Crop	**Scenario**	**Waterbody**	**PEC_{sw} (µg/L)**	**Dominant route of entry**	**PEC_{sw} (µg/L)**	**Dominant route of entry**
Maize 1 x 16 g a.s./ha	D3	Ditch	0.220	Drainage	0.220	Drainage
	D4	Pond	0.376	Drainage	0.376	Drainage
	D4	Stream	0.189	Drainage	0.189	Drainage
	D5	Pond	0.156	Drainage	0.156	Drainage
	D5	Stream	0.078	Drainage	0.078	Drainage
	D6	Ditch	0.039	Drainage	0.039	Drainage
	R1	Pond	0.003	Runoff	0.002	Runoff
	R1	Stream	0.070	Runoff	0.036	Runoff
	R2	Stream	0.241	Runoff	0.125	Runoff
	R3	Stream	0.294	Runoff	0.154	Runoff
	R4	Stream	0.362	Runoff	0.190	Runoff
Maize 1 x 20 g a.s./ha	D3	Ditch	0.281	Drift	0.280	Drainage
	D4	Pond	0.478	Drainage	0.478	Drainage
	D4	Stream	0.240	Drainage	0.240	Drainage
	D5	Pond	0.199	Drainage	0.199	Drainage
	D5	Stream	0.100	Drainage	0.100	Drainage
	D6	Ditch	0.049	Drainage	0.049	Drainage
	R1	Pond	0.004	Runoff	0.002	Runoff
	R1	Stream	0.088	Runoff	0.044	Runoff
	R2	Stream	0.303	Runoff	0.157	Runoff
	R3	Stream	0.367	Runoff	0.192	Runoff
	R4	Stream	0.453	Runoff	0.237	Runoff

Table A 54: FOCUS Step 4 Global Maximum PECsw for prosulfuron following single application to winter cereals and spring cereals (Tier 1)

Mitigation options						
Vegetative strip (m)			**10-12**		**18-20**	
No spray buffer (m)			**10**		**20**	
Nozzle reduction (%)			**-**		**-**	
Crop	**Scenario**	**Waterbody**	**PEC_{sw} (µg/L)**	**Dominant route of entry**	**PEC_{sw} (µg/L)**	**Dominant route of entry**
Winter cereals 1 x 15 g a.s./ha	D1	Ditch	2.16	Drainage	2.16	Drainage
	D1	Stream	1.35	Drainage	1.35	Drainage
	D2	Ditch	2.25	Drainage	2.25	Drainage
	D2	Stream	1.43	Drainage	1.43	Drainage
	D3	Ditch	0.154	Drift	0.147	Drift
	D4	Pond	0.271	Drainage	0.271	Drainage
	D4	Stream	0.140	Drainage	0.140	Drainage
	D5	Pond	0.104	Drainage	0.104	Drainage
	D5	Stream	0.052	Drainage	0.052	Drainage
	D6	Ditch	0.038	Drift	0.031	Drift
	R1	Pond	0.004	Runoff	0.002	Runoff
	R1	Stream	0.126	Runoff	0.066	Runoff
	R3	Stream	0.279	Runoff	0.146	Runoff
	R4	Stream	0.012	Drift	0.006	Drift
Spring cereals 1 x 15 g a.s./ha	D1	Ditch	0.454	Drainage	0.454	Drainage
	D1	Stream	0.293	Drainage	0.293	Drainage
	D3	Ditch	0.189	Drift	0.182	Drift
	D4	Pond	0.325	Drainage	0.325	Drainage
	D4	Stream	0.156	Drainage	0.156	Drainage
	D5	Pond	0.108	Drainage	0.108	Drainage
	D5	Stream	0.052	Drainage	0.052	Drainage
	R4	Stream	0.012	Drift	0.006	Drift

Table A 55: FOCUS Step 4 Global Maximum PECsw for prosulfuron following single application to maize (Tier 2)

Mitigation options						
Vegetative strip (m)			**10-12**		**18-20**	
No spray buffer (m)			**10**		**20**	
Nozzle reduction (%)			**-**		**-**	
Crop	**Scenario**	**Waterbody**	**PEC_{sw} (µg/L)**	**Dominant route of entry**	**PEC_{sw} (µg/L)**	**Dominant route of entry**
Maize 1 x 16 g a.s./ha	D3	Ditch	0.023	Drift	0.016	Drift
	D4	Pond	0.024	Drainage	0.024	Drainage
	D4	Stream	0.020	Drift	0.015	Drainage
	D5	Pond	0.011	Drift	0.010	Drainage
	D5	Stream	0.019	Drift	0.011	Drift
	D6	Ditch	0.015	Drift	0.008	Drift
	R1	Pond	0.003	Runoff	0.002	Runoff
	R1	Stream	0.069	Runoff	0.035	Runoff
	R2	Stream	0.223	Runoff	0.115	Runoff
	R3	Stream	0.279	Runoff	0.146	Runoff
	R4	Stream	0.349	Runoff	0.183	Runoff
Maize 1 x 20 g a.s./ha	D3	Ditch	0.030	Drift	0.021	Drift
	D4	Pond	0.031	Drainage	0.031	Drainage
	D4	Stream	0.025	Drift	0.019	Drainage
	D5	Pond	0.014	Drift	0.013	Drainage
	D5	Stream	0.024	Drift	0.014	Drift
	D6	Ditch	0.019	Drift	0.010	Drift
	R1	Pond	0.004	Runoff	0.002	Runoff
	R1	Stream	0.086	Runoff	0.043	Runoff
	R2	Stream	0.280	Runoff	0.145	Runoff
	R3	Stream	0.348	Runoff	0.182	Runoff
	R4	Stream	0.437	Runoff	0.229	Runoff

Table A 56: FOCUS Step 4 Global Maximum PECsw for prosulfuron following single application to winter cereals and spring cereals (Tier 2)

Mitigation options						
Vegetative strip (m)			**10-12**		**18-20**	
No spray buffer (m)			**10**		**20**	
Nozzle reduction (%)			-		-	
Crop	**Scenario**	**Waterbody**	**PEC_{sw} (µg/L)**	**Dominant route of entry**	**PEC_{sw} (µg/L)**	**Dominant route of entry**
Winter cereals 1 x 15 g a.s./ha	D1	Ditch	1.99	Drainage	1.99	Drainage
	D1	Stream	1.25	Drainage	1.25	Drainage
	D2	Ditch	2.10	Drainage	2.10	Drainage
	D2	Stream	1.33	Drainage	1.33	Drainage
	D3	Ditch	0.018	Drift	0.011	Drift
	D4	Pond	0.016	Drainage	0.016	Drainage
	D4	Stream	0.018	Drift	0.012	Drift
	D5	Pond	0.005	Drift	0.004	Drift
	D5	Stream	0.016	Drift	0.009	Drift
	D6	Ditch	0.022	Drift	0.016	Drift
	R1	Pond	0.004	Runoff	0.002	Runoff
	R1	Stream	0.122	Runoff	0.064	Runoff
	R3	Stream	0.272	Runoff	0.143	Runoff
	R4	Stream	0.012	Drift	0.006	Drift
Spring cereals 1 x 15 g a.s./ha	D1	Ditch	0.292	Drainage	0.292	Drainage
	D1	Stream	0.192	Drainage	0.192	Drainage
	D3	Ditch	0.020	Drift	0.014	Drift
	D4	Pond	0.021	Drainage	0.021	Drainage
	D4	Stream	0.018	Drift	0.013	Drainage
	D5	Pond	0.004	Drift	0.004	Drift
	D5	Stream	0.016	Drift	0.008	Drift
	R4	Stream	0.012	Drift	0.006	Drift

A 3.5 González Camarero, P. (2020): Nicosulfuron - A Leaching Assessment for Parent and Metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466. Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Maize

Comments of zRMS:	The submitted report for PECgw assessment was accepted. The application every third year was considered. The used endpoints and PUF = 0.0 were accepted.

Reference: KCP 9.2.4 / 01

Report: Nicosulfuron - A Leaching Assessment for Parent and Metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466. Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Maize, González Camarero, P. (2020), knoell Germany GmbH, Mannheim, Germany, Report No 113644-2. (Syngenta File No VV-877107)

Guideline(s): Yes:
EFSA, 2014. Guidance Document for evaluating laboratory and field dissipation studies to obtain $DegT_{50}$ values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal, 12(5): 3662.

European Commission (2014). Assessing potential for movement of active substances and their metabolites to groundwater in the EU. Report of the FOCUS groundwater work group, EC document reference Sanco/13144/2010 version 3, 613 pp.

FOCUS (2000). FOCUS groundwater scenarios in the EU review of active substances. Report of the FOCUS groundwater scenarios workgroup, EC document reference Sanco/321/2000 rev. 2, 202 pp.

FOCUS (2014). Generic guidance for Tier 1 FOCUS groundwater assessments, version 2.2. FOCUS groundwater scenarios working group.

Deviations: No

GLP: Not applicable

Acceptability: Yes/No/Supplementary

A 3.5.1 Materials and methods

This report describes a FOCUS groundwater modelling study that examined the potential for nicosulfuron and its metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466 to reach groundwater following application to maize. The FOCUS simulation models FOCUS PEARL (v4.4.4), FOCUS PELMO (v5.5.3) and MACRO (v5.5.4) were used in the modelling study.

Single application each at rates of 40 and 50 g a.s./ha, from approximately BBCH 12-18 were considered. The input parameters relating to application are shown in Table A 57 , below.

Table A 57: Application patterns of nicosulfuron to maize used in modelling

Crop	Maize	Maize

Application rate (g a.s./ha)	40	50
Number of applications / interval (d)	1 / -	1 / -
Relative application date	3 days after emergence	3 days after emergence
Crop interception (%)	25	25
Frequency of application	triennial	triennial
Models used for calculation	FOCUS PEARL v4.4.4, FOCUS PELMO v5.5.3, MACRO v5.5.4	

Applications were considered for the FOCUS scenarios in PEARL and PELMO Châteaudun, Hamburg, Kremsmünster, Okehampton, Piacenza, Porto, Sevilla and Thiva. For MACRO, only the scenario 'Châteaudun' is defined. Application dates are presented in Table A 58, below. According to the recommend application period of nicosulfuron the application starts 3 days after emergence. Simulations were carried out using the FOCUS standard crop 'maize' in FOCUS PEARL, FOCUS PELMO and FOCUS-MACRO. Simulations were carried out over 66 years, as proposed by FOCUS for pesticides that are applied triennially. The first 6 years are intended to be a 'warm up' period, thus the following 60 years were taken into account for the assessment of the leaching behaviour.

Table A 58: Application dates of nicosulfuron to maize used in modelling

Crop	Scenario	Application dates (absolute)
		1st Application
Maize BBCH 12-18	Châteaudun	04-May (124)
	Hamburg	08-May (128)
	Kremsmünster	08-May (128)
	Okehampton	28-May (148)
	Piacenza	18-May (138)
	Porto	04-May (124)
	Sevilla	10-Mar (69)
	Thiva	23-Apr (113)

[a] For winter cereals fixed dates were used

The input parameters of nicosulfuron and its metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466 used in modelling are shown in Table A 59, below. All other input values were set at the default values unless otherwise stated. A schematic diagram of the modelled route of degradation of nicosulfuron in soil is shown in Figure A 6. Since the complex degradation scheme of active substance cannot be implemented in the GUI of MACRO, all metabolites were assumed to form directly from active substance. For this purpose, the formation fraction of secondary metabolites was corrected for the formation of preceding metabolites, e.g.:

$FF(tot)_{P \rightarrow met\ 2} = FF_{P \rightarrow met\ 1} \times FF_{met\ 1 \rightarrow met\ 2}$

With:

$FF(tot)_{P \rightarrow met\ 2}$	= total formation fraction from parent to secondary metabolite
$FF_{P \rightarrow met\ 1}$	= formation fraction for parent to primary metabolite
$FF_{met\ 1 \rightarrow met\ 2}$	= formation fraction from primary metabolite to secondary metabolite

Additionally, molar based formation fractions have to be corrected for molar mass differences between metabolite and parent to get conversion fractions for MACRO.

Table A 59: Summary of input parameters nicosulfuron and its metabolites HMUD, AUSN for PEC_{GW} calculations

Compound	Nicosulfuron	HMUD	AUSN	Value in accordance with EU endpoint / Reference
Molar mass (g/mol)	410.4	396.4	314.3	Yes / EFSA, 2007
Water solubility (mg/L)	9500 (25 °C)	9500 (25 °C)	9500 (25 °C)	Yes / EFSA, 2007 Metabolites: same value as for parent were used
Saturated vapour pressure (Pa)	0[a] (20 °C)	0 (20 °C)	0 (20 °C)	Yes / EFSA, 2007 Worst case assumption
DT_{50} in soil (d)	16.4 (geometric laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 7)	23.8 (geometric laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 2)	192.3 (maximum laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	Yes / EFSA, 2007
Transformation rate	0.018681 to HMUD 0.009045 to ASDM 0.009045 to ADMP 0.005494 to sink	0.020008 to AUSN 0.009116 to UCSN	0.003605 to sink	for PELMO; (ln(2) / DT_{50}) × FFm
K_{FOC} / K_{FOM} (mL/g)	24.6 / 14.3 (geometric mean, n = 14)	3.9 / 2.26 (geometric mean, n = 5)	13 /7.54 [c,d] (pH ≤ 6) 22.3 / 12.9 [e] (6 < pH < 7) 37.3 / 21.6 [f] (pH ≥ 7)	No[b] / EFSA, 2007 and Graham & Strachan, 2008 (nicosulfuron only) K_{FOM} calculated from K_{FOC} $K_{FOM} = K_{FOC} / 1.724$

Compound	Nicosulfuron	HMUD	AUSN	Value in accordance with EU endpoint / Reference
1/n	0.952 (arithmetic mean, n = 14)	0.90 (default value)	0.98 [c,d] (pH ≤ 6) 0.96 [e] (6 < pH < 7) 0.95 [f] (pH ≥ 7)	Yes / EFSA, 2007 and Graham & Strachan, 2008 (nicosulfuron only)
Plant uptake factor	0	0	0	Yes / EFSA, 2007 and Derz, 2013 for parent Worst case assumption
Formation fraction	0.442 to HMUD 0.214 to ASDM 0.214 to ADMP	0.687 to AUSN 0.313 to UCSN	NA	Yes / EFSA, 2007
Conversion fraction[g]	-	0.427	0.233	Calculated

[a] Measured value < 8 × 10^{-10} Pa for parent; loss due to volatilisation was not considered (i.e. set to 0) as worst-case for modelling
[b] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2007 and Graham & Strachan, 2008
[c] pH dependent sorption; value specific for Hamburg, Okehampton and Porto scenarios
[d] pH dependent sorption; value specific for Piacenza scenario
[e] pH dependent sorption; value specific for Sevilla scenario
[f] pH dependent sorption; value specific for Châteaudun, Kremsmünster and Thiva scenarios
[g] for use in FOCUS MACRO, formation fraction corrected for molar mass differences

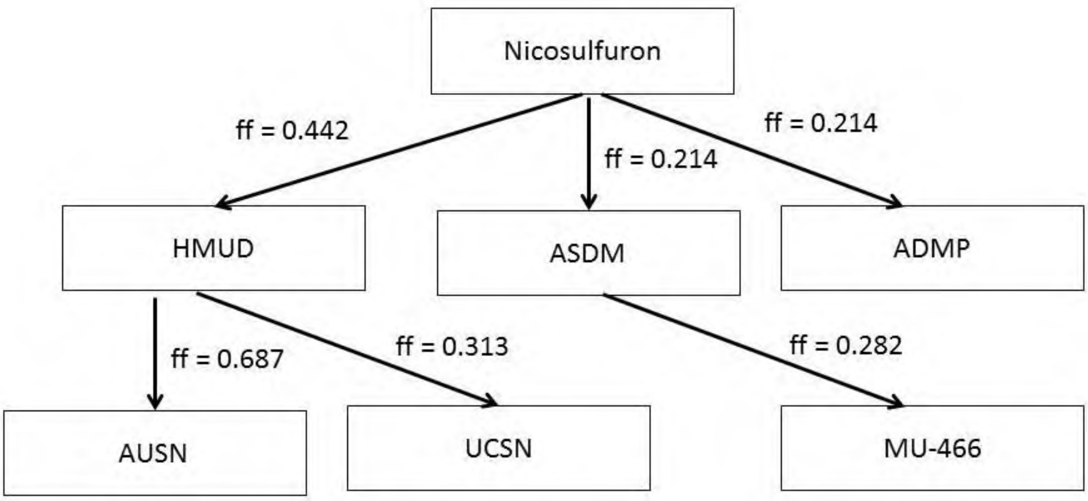
Table A 60: Summary of input parameters for nicosulfuron metabolites ADMP, UCSN, ASDM and MU-466 for PEC_{GW} calculations

Compound	ADMP	UCSN	ASDM	MU-466	Value in accordance with EU endpoint / Reference
Molar mass (g/mol)	155.2	315.3	229.2	215.1	Yes / EFSA, 2007
Water solubility (mg/L)	9500 (25 °C)	9500 (25 °C)	9500 (25 °C)	9500 (25 °C)	Yes / EFSA, 2007 Metabolites: same value as for parent were used
Saturated vapour pressure (Pa)	0 (20 °C)	0 (20 °C)	0 (20 °C)	0 (20 °C)	Yes / EFSA, 2007 Worst case assumption
DT_{50} in soil (d)	4.5 (geometric laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	271.0 (maximum laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	236.6 (maximum laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	75.5 (maximum laboratory, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n = 3)	Yes / EFSA, 2007
Transformation	0.154033 to sink	0.002558 to sink	0.000826 to	0.009181 to sink	for PELMO; (ln(2) /

Compound	ADMP	UCSN	ASDM	MU-466	Value in accordance with EU endpoint / Reference
rate			MU-466 0.002103 to sink		DT_{50}) × FFm
K_{FOC} / K_{FOM} (mL/g)	51.1 / 29.6 (geometric mean, n = 4)	2.6 / 1.5 (geometric mean, n = 4)	2.3 / 1.3 [b,c] (pH ≤ 6) 6.0 / 3.5 [d] (6 < pH < 7) 7.2 / 4.2 [e] (pH ≥ 7)	2.97 / 1.7 [b] (pH ≤ 6) 5.4 / 3.1 [c,d] (6 < pH < 7) 13.1 / 7.6 [e] (pH ≥ 7)	No[a] / EFSA, 2007 K_{FOM} calculated from K_{FOC} $K_{FOM} = K_{FOC} / 1.724$
1/n	0.87 (arithmetic mean, n = 4)	0.90 (default value)	0.82 [b,c] (pH ≤ 6) 0.94 [d,e] (pH ≥ 7)	0.90 (default value)	Yes / EFSA, 2007
Plant uptake factor	0	0	0	0	Yes / EFSA, 2007 Worst case assumption
Formation fraction	NA	NA	0.282 to MU-466	NA	Yes / EFSA, 2007
Conversion fraction[f]	0.081	0.106	0.120	0.032	Calculated

[a] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2007 and Graham & Strachan, 2008
[b] pH dependent sorption; value specific for Hamburg, Okehampton and Porto scenarios
[c] pH dependent sorption; value specific for Piacenza scenario
[d] pH dependent sorption; value specific for Sevilla scenario
[e] pH dependent sorption; value specific for Châteaudun, Kremsmünster and Thiva scenarios
[f] for use in FOCUS MACRO, formation fraction corrected for molar mass differences

Figure A 6: Schematic diagram of the modelled route of degradation of nicosulfuron



[a] ff= formation fraction

A 3.5.2 Results

Predicted environmental concentrations for nicosulfuron and its metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466 in groundwater (PEC_{GW}) were calculated for the use nicosulfuron on maize in Europe in accordance with FOCUS guidelines (FOCUS, 2000, 2014, EC 2014).

The 80th percentile (at 1 m soil depth) PEC_{GW} values generated by the FOCUS PEARL, FOCUS PELMO and MACRO simulations are given in Table A 61, Table A 62 and Table A 63.

Table A 61: PEC_{GW} for nicosulfuron and its metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466 (with FOCUS PEARL v4.4.4)

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)						
		Nicosulfuron	HMUD	AUSN	UCSN	ASDM	ADMP	MU-466
Maize 1 × 40 g a.s./ha BBCH 12-18	Châteaudun	0.017	0.193	0.528	0.361	0.405	< 0.001	0.019
	Hamburg	0.039	0.363	0.751	0.407	0.469	< 0.001	0.023
	Kremsmünster	0.029	0.212	0.401	0.318	0.344	< 0.001	0.015
	Okehampton	0.052	0.238	0.389	0.191	0.246	< 0.001	0.010
	Piacenza	0.009	0.101	0.637	0.362	0.353	< 0.001	0.025
	Porto	0.003	0.057	0.284	0.151	0.157	< 0.001	0.010
	Sevilla	< 0.001	0.015	0.507	0.607	0.479	< 0.001	0.047
	Thiva	0.004	0.097	1.16	1.09	0.983	< 0.001	0.067
Maize 1 × 50 g a.s./ha BBCH 12-18	Châteaudun	0.022	0.244	0.662	0.450	0.506	< 0.001	0.024
	Hamburg	0.050	0.458	0.938	0.508	0.589	< 0.001	0.029
	Kremsmünster	0.037	0.268	0.502	0.398	0.431	< 0.001	0.019
	Okehampton	0.066	0.299	0.486	0.239	0.308	< 0.001	0.012
	Piacenza	0.012	0.127	0.798	0.453	0.443	< 0.001	0.031
	Porto	0.004	0.072	0.354	0.189	0.197	< 0.001	0.012
	Sevilla	< 0.001	0.019	0.638	0.761	0.600	< 0.001	0.059
	Thiva	0.005	0.122	1.46	1.37	1.23	< 0.001	0.085

Table A 62: PEC_{GW} for nicosulfuron and its metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466 (with FOCUS PELMO v5.5.3)

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)						
		Nicosulfuron	HMUD	AUSN	UCSN	ASDM	ADMP	MU-466
Maize	Châteaudun	0.007	0.114	0.842	0.412	0.406	< 0.001	0.024

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)						
		Nicosulfuron	**HMUD**	**AUSN**	**UCSN**	**ASDM**	**ADMP**	**MU-466**
	Hamburg	0.020	0.250	0.799	0.371	0.407	< 0.001	0.022
	Kremsmünster	0.023	0.209	0.670	0.352	0.348	< 0.001	0.017
	Okehampton	0.044	0.222	0.415	0.189	0.229	< 0.001	0.011
	Piacenza	0.017	0.119	0.470	0.219	0.232	< 0.001	0.013
	Porto	0.003	0.046	0.325	0.149	0.154	< 0.001	0.010
	Sevilla	< 0.001	0.021	0.833	0.402	0.331	< 0.001	0.032
	Thiva	0.003	0.070	1.43	0.718	0.644	< 0.001	0.047
Maize 1 × 50 g a.s./ha BBCH 12-18	Châteaudun	0.009	0.143	1.05	0.515	0.509	< 0.001	0.030
	Hamburg	0.026	0.315	0.998	0.463	0.511	< 0.001	0.028
	Kremsmünster	0.029	0.263	0.836	0.441	0.436	< 0.001	0.021
	Okehampton	0.056	0.280	0.518	0.236	0.287	< 0.001	0.013
	Piacenza	0.022	0.150	0.588	0.274	0.291	< 0.001	0.017
	Porto	0.004	0.058	0.406	0.186	0.193	< 0.001	0.013
	Sevilla	< 0.001	0.027	1.04	0.504	0.414	< 0.001	0.040
	Thiva	0.004	0.088	1.79	0.898	0.807	< 0.001	0.059

Table A 63: **PEC_{GW} for nicosulfuron and its metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466 (with MACRO v5.5.4)**

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)						
		Nicosulfuron	**HMUD**	**AUSN**	**UCSN**	**ASDM**	**ADMP**	**MU-466**
Maize 1 × 40 g a.s./ha BBCH 12-18	Châteaudun	0.009	0.103	0.389	0.360	0.356	< 0.001	0.026
Maize 1 × 50 g a.s./ha BBCH 12-18	Châteaudun	0.012	0.130	0.491	0.450	0.446	< 0.001	0.033

Table A 64: **Summary of maximum PECGW across all models for nicosulfuron and its metabolites HMUD, AUSN, UCSN, ASDM, ADMP and MU-466 (refer to A 3.5 González Camarero, 2020)**

Substance	80th Percentile PEC_{GW} (µg/L)	Crop	Application rate (g a.s./ha)	BBCH stage	Model and Version Number	Scenario
Nicosulfuron	0.052	Maize	1 × 40	12-18	PEARL v4.4.4	Okehampton

Substance	80^{th} Percentile PEC_{GW} (µg/L)	Crop	Application rate (g a.s./ha)	BBCH stage	Model and Version Number	Scenario
HMUD	0.363				PEARL v4.4.4	Hamburg
AUSN	1.43				PELMO v5.5.3	Thiva
UCSN	1.09				PEARL v4.4.4	Thiva
ASDM	0.983				PEARL v4.4.4	Thiva
ADMP	< 0.001				All models	All scenario
MU-466	0.067				PEARL v4.4.4	Thiva
Nicosulfuron	0.066	Maize	1 × 50	12-18	PEARL v4.4.4	Okehampton
HMUD	0.458				PEARL v4.4.4	Hamburg
AUSN	1.79				PELMO v5.5.3	Thiva
UCSN	1.37				PEARL v4.4.4	Thiva
ASDM	1.23				PEARL v4.4.4	Thiva
ADMP	< 0.001				All models	All scenarios
MU-466	0.085				PEARL v4.4.4	Thiva

A 3.6 González Camarero, P. (2020a): Nicosulfuron - A European Environmental Fate Assessment for Nicosulfuron Using the FOCUS Surface Water Models at Steps 3 to 4 Following Spray Application to Maize

Comments of zRMS:	The submitted report for PECsw/sed assessment was accepted. The used endpoints and PUF = 0.0 were accepted. In Step 4 the SWAN and VFSmod were used. The mitigation measures were proposed.

Reference:	KCP 9.2.5 / 01
Report	Nicosulfuron - A European Environmental Fate Assessment for Nicosulfuron Using the FOCUS Surface Water Models at Steps 3 to 4 Following Spray Application to Maize, González Camarero, P. (2020), knoell Germany GmbH, Mannheim, Germany, Report No 113644-3. (Syngenta File No VV-877111)
Guideline(s):	Yes: FOCUS (2001). FOCUS Surface Water Scenarios in the EU Evaluation Process under 91/414/EEC. Report of the FOCUS Working Group on Surface Water Scenarios, EC Document Reference SANCO/4802/2001 rev. 2. FOCUS (2007). Landscape and Mitigation Factors In Aquatic Ecological Risk Assessment. Volume 1. Extended Summary and Recommendations, The Final Report of the FOCUS Working Group on Landscape and Mitigation Factors in Ecological Risk Assessment, EC Document Reference Sanco/10422/2005, version 2.0, September 2007. FOCUS (2015). Generic Guidance for FOCUS Surface Water Scenarios, version 1.4.
Deviations:	No
GLP:	Not applicable
Acceptability:	Yes/No/Supplementary

A 3.6.1 Materials and methods

This report describes a FOCUS modelling study that examined the potential for nicosulfuron to reach surface water following foliar application to maize. The FOCUS tool SWASH (v 5.3), including the operational models FOCUS-MACRO (v 5.5.4), FOCUS-PRZM (v 4.3.1) and FOCUS-TOXSWA (v 5.5.3), were used in the modelling study for Step 3 simulations. The ECPA tool SWAN (v 5.0) was used to implement mitigation options at Step 4.

Single foliar applications each at rate of 40 and 50 g a.s./ha, from approximately growth stage BBCH 12-18 were considered. The input parameters relating to application are shown below.

Table A 65: Input parameters related to application for PEC $_{SW/SED}$ calculations

Crop	Maize	Maize
Application rate (g a.s./ha)	40	50
Number of applications / interval (d)	1 / -	1 / -

Application method	Ground spray	Ground spray
CAM (Chemical application method)	2	2
Soil depth (cm)	4	4
Models used for calculation	FOCUS SWASH v5.3, FOCUS PRZM v4.3.1, FOCUS MACRO v5.5.4, FOCUS TOXWA v5.5.3 ECPA SWAN v5.0	

Ground spray application (foliar spray) was considered as the application method in all simulations. Crop interception at Step 3 is calculated internally by the model on the basis of the maximum interception capacity and the actual leaf area index.

An application window has to be specified from which the Pesticide Application Timer (PAT), internal to the model, determines actual application dates which were set generically for all scenarios. According to the recommend application period of nicosulfuron the application starts 3 days after emergence. Simulations were carried out using the FOCUS standard crop maize.

The application windows used for each scenario are shown in Table A 66, below.

Table A 66: FOCUS Step 3 Scenario related input parameters for PEC $_{SW/SED}$ calculations for the application of nicosulfuron

Crop	Scenario	Nicosulfuron	
		Application window used in modelling	
		Start of Window	End of Window
Maize BBCH 12-18	D3	08-May (128)	07-Jun (158)
	D4	13-May (133)	12-Jun (163)
	D5	13-May (133)	12-Jun (163)
	D6	23-Apr (113)	23-May (143)
	R1	06-May (126)	05-Jun (156)
	R2	04-May (124)	03-Jun (154)
	R3	04-May (124)	03-Jun (154)
	R4	13-Apr (103)	13-May (133)

Numbers in brackets are the corresponding ‘Julian Day’ numbers

Step 4 calculations were carried out for those scenarios, which require mitigation with the following mitigation methods:

- spray drift reduction by a non-sprayed buffer strip of 5m.
- spray drift and run off reduction by a non-sprayed and vegetated buffer stripes of 5m using runoff and erosion reduction values as given by EXPOSIT 3.0 – runoff/erosion reduction of 40/40% for 5m.
- spray drift and run off reduction by a non-sprayed and vegetated buffer stripes of10m and 20m using runoff and erosion reduction values as given by the FOCUS Working Group on Landscape and Mitigation Factors (2007) – runoff/erosion reduction of 60/85% for 10m and 90/95% for 20m.
- runoff reduction by vegetated buffer stripes of 5m as calculated with the VFSmod module (Brown et al, 2012) within Swan

Table A 67: Input parameters related to active substance nicosulfuron for PEC $_{SW/SED}$ calculations

Compound	Nicosulfuron	Value in accordance to EU endpoint / Reference
Molar mass (g/mol)	410.4	Yes / EFSA, 2007
Water solubility (mg/L)	9500 (20 °C)	Yes / EFSA, 2007
Saturated vapour pressure (Pa)	$< 8 \times 10^{-10}$ (25 °C)	Yes / EFSA, 2007
K_{FOC} (mL/g)[a]	24.6 (geometric mean, n = 14)	No[b] / EFSA, 2007 and Graham & Strachan, 2008
Freundlich Exponent 1/n	0.95 (arithmetic mean, n = 14)	No / EFSA, 2007 and Graham & Strachan, 2008
Plant Uptake	0	FOCUS default
$DT_{50,soil}$ (d)	16.4 (geometric mean, normalisation to 10 kPa or pF2, 20 °C with Q_{10} of 2.2, n =7)	Yes / EFSA, 2007
$DT_{50,water}$ (d)	42.3 (whole system value, maximum, n= 2)	Yes / EFSA, 2007
$DT_{50,sed}$ (d)	1000	FOCUS default
$DT_{50,whole\ system}$ (d)	42.3 (whole system value, maximum, n= 2)	Yes / EFSA, 2007

[a] the K_{FOC} value named here was entered in the SWASH GUI. The corresponding K_{FOM} value given in the model input files is calculated internally by the model.
[b] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2007 and Graham & Strachan, 2008

A 3.6.2 Results

Predicted environmental concentrations in surface water (PEC_{SW}) and sediment (PEC_{SED}) were calculated for the use of nicosulfuron on maize in Europe in accordance with FOCUS guidelines.

The results are presented in the tables below in the following order:

FOCUS Step 3 Global Maximum PEC_{SW} and PEC_{SED} for nicosulfuron following single application to maize

FOCUS Application dates and global maximum timing

FOCUS Step 3 Time Weighted Average for nicosulfuron following single application to maize

FOCUS Step 4 Global Maximum PECSW for nicosulfuron following single application to maize

FOCUS Step 4 Global Maximum PEC_{SW} for nicosulfuron following single application to maize with VFSmod

Table A 68: FOCUS Step 3 Global Maximum PEC_{SW} and PEC_{SED} nicosulfuron following single application to maize

Application scenario	Scenario	Water body	PEC_{SW} (µg/L)	Dominant Route of Entry	PEC_{SED} (µg/kg)
Maize 1 × 40 g a.s/ha BBCH 12-18	D3	ditch	0.217	Drift	0.038
	D4	pond	0.025	Drainage	0.037
	D4	stream	0.184	Drift	0.017
	D5	pond	0.017	Drift	0.021
	D5	stream	0.191	Drift	0.013
	D6	ditch	0.211	Drift	0.028
	R1	pond	0.016	Runoff	0.013
	R1	stream	0.449	Runoff	0.034
	R2	stream	1.15	Runoff	0.136
	R3	stream	1.64	Runoff	0.166
	R4	stream	1.84	Runoff	0.232
Maize 1 × 50 g a.s/ha BBCH 12-18	D3	ditch	0.272	Drift	0.048
	D4	pond	0.032	Drainage	0.046
	D4	stream	0.230	Drift	0.021
	D5	pond	0.021	Drift	0.027
	D5	stream	0.239	Drift	0.016
	D6	ditch	0.264	Drift	0.034
	R1	pond	0.020	Runoff	0.016
	R1	stream	0.561	Runoff	0.042
	R2	stream	1.45	Runoff	0.170
	R3	stream	2.06	Runoff	0.206
	R4	stream	2.30	Runoff	0.289

Table A 69: FOCUS Application dates and global maximum timing

Application scenario	Scenario	Water body	Application date	Date of global maximum
Maize 1 × 40 g a.s/ha 1 × 50 g a.s/ha BBCH 12-18	D3	ditch	14-May-92	14-May-92
	D4	pond	30-May-85	29-Dec-85
	D4	stream	30-May-85	30-May-85
	D5	pond	27-May-78	27-May-78
	D5	stream	27-May-78	27-May-78

Application scenario	Scenario	Water body	Application date	Date of global maximum
	D6	ditch	23-Apr-86	23-Apr-86
	R1	pond	09-May-84	20-May-84
	R1	stream	09-May-84	14-May-84
	R2	stream	07-May-77	13-May-77
	R3	stream	18-May-80	23-May-80
	R4	stream	13-Apr-84	18-Apr-84

Table A 70: FOCUS Step 3 Time Weighted Average nicosulfuron following single application to maize

Application scenario	Scenario	Water body	Max TWA PEC_{SW}		
			7 day	21 day	28 day
Maize 1 × 40 g a.s/ha BBCH 12-18	D3	ditch	0.043	0.019	0.016
	D4	pond	0.025	0.025	0.024
	D4	stream	0.016	0.015	0.014
	D5	pond	0.016	0.014	0.014
	D5	stream	0.009	0.009	0.008
	D6	ditch	0.034	0.012	0.009
	R1	pond	0.016	0.014	0.013
	R1	stream	0.033	0.012	0.009
	R2	stream	0.104	0.035	0.026
	R3	stream	0.160	0.056	0.042
	R4	stream	0.207	0.076	0.057
Maize 1 × 50 g a.s/ha BBCH 12-18	D3	ditch	0.054	0.024	0.021
	D4	pond	0.032	0.031	0.031
	D4	stream	0.020	0.019	0.017
	D5	pond	0.020	0.018	0.017
	D5	stream	0.012	0.011	0.010
	D6	ditch	0.043	0.015	0.012
	R1	pond	0.019	0.017	0.016
	R1	stream	0.041	0.015	0.011
	R2	stream	0.130	0.044	0.033
	R3	stream	0.199	0.070	0.053
	R4	stream	0.259	0.095	0.071

Table A 71: FOCUS Step 4 Global Maximum PEC_{SW} for nicosulfuron following single application to maize

			Mitigation options							
Vegetative strip (m)			-		5[a]		10-12[b]		18-20[c]	
No spray buffer (m)			5		5		10		20	
Use	**Scenario**	**Water body**	**PEC_{SW} (µg/L)**	**Dominant route of entry**	**PEC_{SW} (µg/L)**	**Dominant route of entry**	**PEC_{SW} (µg/L)**	**Dominant route of entry**	**PEC_{SW} (µg/L)**	**Dominant route of entry**
Maize 1 × 40 g a.s/ha BBCH 12-18	D3	ditch	0.076	Drift	0.076	Drift	0.044	Drift	0.026	Drift
	D4	pond	0.025	Drainage	0.025	Drainage	0.025	Drainage	0.025	Drainage
	D4	stream	0.080	Drift	0.080	Drift	0.044	Drift	0.025	Drift
	D5	pond	0.016	Drift	0.016	Drift	0.014	Drift	0.013	Drainage
	D5	stream	0.082	Drift	0.082	Drift	0.045	Drift	0.025	Drift
	D6	ditch	0.070	Drift	0.070	Drift	0.037	Drift	0.020	Drift
	R1	pond	0.016	Runoff	0.012	Runoff	0.008	Runoff	0.005	Runoff
	R1	stream	0.449	Runoff	0.274	Runoff	0.184	Runoff	0.093	Runoff
	R2	stream	1.15	Runoff	0.738	Runoff	0.509	Runoff	0.263	Runoff
	R3	stream	1.64	Runoff	1.07	Runoff	0.743	Runoff	0.389	Runoff
	R4	stream	1.84	Runoff	1.20	Runoff	0.835	Runoff	0.438	Runoff
Maize 1 × 50 g a.s/ha BBCH 12-18	D3	ditch	0.095	Drift	0.095	Drift	0.055	Drift	0.033	Drift
	D4	pond	0.032	Drainage	0.032	Drainage	0.032	Drainage	0.032	Drainage
	D4	stream	0.100	Drift	0.100	Drift	0.055	Drift	0.031	Drift
	D5	pond	0.020	Drift	0.020	Drift	0.017	Drift	0.017	Drainage
	D5	stream	0.103	Drift	0.103	Drift	0.056	Drift	0.031	Drift
	D6	ditch	0.087	Drift	0.087	Drift	0.047	Drift	0.025	Drift
	R1	pond	0.020	Runoff	0.015	Runoff	0.010	Runoff	0.006	Runoff
	R1	stream	0.561	Runoff	0.343	Runoff	0.230	Runoff	0.116	Runoff
	R2	stream	1.45	Runoff	0.925	Runoff	0.638	Runoff	0.330	Runoff
	R3	stream	2.06	Runoff	1.33	Runoff	0.929	Runoff	0.486	Runoff
	R4	stream	2.30	Runoff	1.50	Runoff	1.04	Runoff	0.547	Runoff

[a] equivalent to 40% runoff mitigation (EXPOSIT 3.0)
[b] equivalent to 60% runoff mitigation (FOCUS, 2007)
[c] equivalent to 80% runoff mitigation (FOCUS, 2007)

Table A 72: FOCUS Step 4 Global Maximum PEC_{SW} nicosulfuron following single application to maize with the VFSmod module

			Mitigation options	
		Vegetative strip (m)	**5 [a]**	
		No spray buffer (m)	**-**	
Use	**Scenario**	**Water body**	**PEC_{SW} (µg/L)**	**Dominant route of entry**
Maize 1 × 40 g a.s/ha BBCH 12-18	R1	pond	0.008	Drift
	R1	stream	0.143	Drift
	R2	stream	0.195	Drift
	R3	stream	0.204	Drift
	R4	stream	0.145	Drift
Maize 1 × 50 g a.s/ha BBCH 12-18	R1	pond	0.011	Drift
	R1	stream	0.178	Drift
	R2	stream	0.243	Drift
	R3	stream	0.255	Drift
	R4	stream	0.181	Drift

[a] 5 m vegetated filter strip, simulated using VFSMod tool included in SWAN v 5.0.

A 3.7 González Camarero, P. (2020b): Dicamba - A Leaching Assessment for Parent and Metabolite DSCA. Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Maize

Comments of zRMS:	The submitted report for PECgw assessment was accepted. The application every third year was considered. The used endpoints and PUF = 0.0 were accepted.

Reference:	KCP 9.2.4 / 01
Report	Dicamba - A Leaching Assessment for Parent and Metabolite DSCA. Using the PEARL 4.4.4, PELMO 5.5.3 and MACRO 5.5.4 Groundwater Models Following Spray Application to Maize, González Camarero, P., knoell Germany GmbH, Mannheim, Germany, Report No 113644-1. (Syngenta File No VV-877105)
Guideline(s):	Yes: EFSA, 2014. Guidance Document for evaluating laboratory and field dissipation studies to obtain $DegT_{50}$ values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal, 12(5): 3662. European Commission (2014). Assessing potential for movement of active substances and their metabolites to groundwater in the EU. Report of the FOCUS groundwater work group, EC document reference Sanco/13144/2010 version 3, 613 pp. FOCUS (2000). FOCUS groundwater scenarios in the EU review of active substances. Report of the FOCUS groundwater scenarios workgroup, EC document reference Sanco/321/2000 rev. 2, 202 pp. FOCUS (2014). Generic guidance for Tier 1 FOCUS groundwater assessments, version 2.2. FOCUS groundwater scenarios working group.
Deviations:	No
GLP:	Not applicable
Acceptability:	Yes/No/Supplementary

A 3.7.1 Materials and methods

This report describes a FOCUS groundwater modelling study that examined the potential for dicamba and its metabolite DSCA to reach groundwater following application to maize. The FOCUS simulation models FOCUS PEARL (v4.4.4), FOCUS PELMO (v5.5.3) and MACRO (v5.5.4) were used in the modelling study.

Single application each at rates of 160 and 200 g a.s./ha, from approximately BBCH 12-18 were considered. The input parameters relating to application are shown in Table A 73, below.

Table A 73: Application patterns of dicamba to maize used in modelling

Crop	Maize	Maize
Application rate (g a.s./ha)	160	200
Number of applications / interval (d)	1 / -	1 / -
Relative application date	3 days after emergence	3 days after emergence
Crop interception (%)	25	25
Frequency of application	triennial	triennial
Models used for calculation	FOCUS PEARL v4.4.4, FOCUS PELMO v5.5.3, MACRO v5.5.4	

Applications were considered for the FOCUS scenarios in PEARL and PELMO Châteaudun, Hamburg, Kremsmünster, Okehampton, Piacenza, Porto, Sevilla and Thiva. For MACRO, only the scenario 'Châteaudun' is defined. Application dates are presented in Table 2, below. According to the recommend application period of dicamba the application starts 3 days after emergence. Simulations were carried out using the FOCUS standard crop 'maize' in FOCUS PEARL, FOCUS PELMO and FOCUS-MACRO. Simulations were carried out over 66 years, as proposed by FOCUS for pesticides that are applied triennially. The first 6 years are intended to be a 'warm up' period, thus the following 60 years were taken into account for the assessment of the leaching behaviour.

Table A 74: Application dates of dicamba to maize used in modelling

Crop	Scenario	Application dates (absolute)
		1st Application
Maize BBCH 12-18	Châteaudun	04-May (124)
	Hamburg	08-May (128)
	Kremsmünster	08-May (128)
	Okehampton	28-May (148)
	Piacenza	18-May (138)
	Porto	04-May (124)
	Sevilla	10-Mar (69)
	Thiva	23-Apr (113)

Numbers in brackets are corresponding Julian day numbers

The input parameters of dicamba and its metabolite DSCA used in modelling are shown in Table A 75, below. All other input values were set at the default values unless otherwise stated. A schematic diagram of the modelled route of degradation of dicamba in soil is shown in Figure A 7

Molar based formation fractions have to be corrected for molar mass differences between metabolite and parent to get conversion fractions for MACRO.

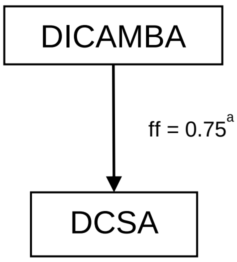
Table A 75: Summary of input parameters for dicamba and its metabolite DSCA for PEC_{GW} calculations

Compound	Dicamba	DSCA	Value in accordance to EU endpoint Reference
Molar mass (g/mol)	221	207	Yes / EFSA, 2011
Water solubility (mg/L)	6600 (25°C)	88,000 (25°C)	Yes / EFSA, 2011

Compound	Dicamba	DSCA	Value in accordance to EU endpoint Reference
Saturated vapour pressure (Pa)	1.67×10^{-3} (25°C)	1.0×10^{-6} (25°C)	Yes / EFSA, 2011 Worst case assumption
DT_{50} in soil (d) lab	4.0 (geometric mean, laboratory, normalisation to pF2, 20 °C with Q_{10} of 2.58, n = 4)	9.4 (geometric mean, laboratory, normalisation to pF2, 20 °C with Q_{10} of 2.58, n = 5)	Yes / EFSA, 2011
K_{FOC} / K_{FOM} (mL/g)	9.82 / 5.70 (geometric mean, n = 4)	877 / 509 (geometric mean, n = 5)	No[a] / EFSA, 2011 K_{FOM} calculated from K_{FOC} $K_{FOM} = K_{FOC} / 1.724$
1/n	0.74 (arithmetic mean, n = 4)	0.80 (arithmetic mean, n = 5)	Yes / EFSA, 2011
Plant uptake factor	0	0	Yes / EFSA, 2011 Worst case assumption
Formation fraction	-	0.75 from parent	Yes / EFSA, 2011
Transformation rate	0.1299651(to DCSA) 0.0433217 (to sink)	0.0737391 (to sink)	for PELMO; (ln(2) / DT_{50}) * FFm
Conversion fraction[b]	-	0.702	Calculated

[a] differs from the EFSA conclusion as the latest guideline (EFSA Journal 2014, 12 (5):3662) recommends the use of the geometric mean instead of the arithmetic mean. The individual values from which the geometric mean is calculated, are those established in EFSA, 2011
[b] for use in FOCUS MACRO, formation fraction corrected for molar mass differences

Figure A 7: Schematic diagram of the modelled route of degradation of dicamba



[a] ff = formation fraction

A 3.7.2 Results

Predicted environmental concentrations for dicamba and its metabolite DSCA in groundwater (PEC_{GW}) were calculated for the use dicamba on maize in Europe in accordance with FOCUS guidelines (FOCUS, 2000, 2014, EC 2014).

The 80th percentile (at 1 m soil depth) PEC_{GW} values generated by the FOCUS PEARL, FOCUS PELMO and MACRO simulations are given in Table A 76, Table A 77 and Table A 78.

Table A 76: PECGW for dicamba and DCSA (with FOCUS PEARL v4.4.4)

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)	
		Dicamba	**DCSA**
Maize 1 × 160 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
	Hamburg	<0.001	<0.001
	Kremsmünster	<0.001	<0.001
	Okehampton	<0.001	<0.001
	Piacenza	<0.001	<0.001
	Porto	<0.001	<0.001
	Sevilla	<0.001	<0.001
	Thiva	<0.001	<0.001
Maize 1 × 200 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
	Hamburg	<0.001	<0.001
	Kremsmünster	<0.001	<0.001
	Okehampton	<0.001	<0.001
	Piacenza	<0.001	<0.001
	Porto	<0.001	<0.001
	Sevilla	<0.001	<0.001
	Thiva	<0.001	<0.001

Table A 77: PEC_{GW} for dicamba and DCSA (with FOCUS PELMO v5.5.3)

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)	
		Dicamba	**DCSA**
Maize 1 × 160 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
	Hamburg	<0.001	<0.001
	Kremsmünster	<0.001	<0.001
	Okehampton	<0.001	<0.001
	Piacenza	<0.001	<0.001
	Porto	<0.001	<0.001
	Sevilla	<0.001	<0.001
	Thiva	<0.001	<0.001
Maize 1 × 200 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
	Hamburg	<0.001	<0.001
	Kremsmünster	<0.001	<0.001
	Okehampton	<0.001	<0.001
	Piacenza	<0.001	<0.001
	Porto	<0.001	<0.001

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)	
		Dicamba	DCSA
	Sevilla	<0.001	<0.001
	Thiva	<0.001	<0.001

Table A 78: PEC_{GW} for dicamba and DCSA (with MACRO v5.5.4)

Crop	Scenario	80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)	
		Dicamba	DCSA
Maize 1 × 160 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001
Maize 1 × 200 g a.s./ha BBCH 12-18	Châteaudun	<0.001	<0.001

Table A 79: Summary of maximum PEC_{GW} across all models for dicamba and DCSA

Substance	80th Percentile PEC_{GW} (µg/L)	Crop	Application rate (g a.s./ha)	BBCH stage	Model and Version Number	Scenario
Dicamba	< 0.001	Maize	1 x 160	12-18	All models	All scenarios
DCSA	< 0.001				All models	All scenarios
Dicamba	< 0.001	Maize	1 x 200	12-18	All models	All scenarios
DCSA	< 0.001				All models	All scenarios