Renewal Assessment Report

under Regulation (EC) 1107/2009

Zoxamide

Zoxium 240 SC

Volume 3

Plant protection product
B.8 Environmental fate and behavior

Rapporteur Member State: Latvia
Co-Rapporteur Member State: France

Version history

Date	Subject
May 2001	Initial DAR. Draft Assessment Report (DAR) – prepared in the context of the application for the first inclusion of the a.s. in Annex I to Council Directive 91/414/EEC.
July 2016	Renewal Assessment Report (RAR) – prepared in the context of the application for renewal of approval of the a.s. according to Regulation (EC) No 1107/2009. Evaluation of the previous Annex I inclusion is not reported in this document since the representative formulation (Zoxium 240 SC) supporting the application for renewal approval of zoxamide is different from the formulation evaluated in the initial DAR. For most parts of the current assessment, no specific studies performed with the formulation have been done. For these parts, it is referred to the fate and behavior of the active substance. The information considered as not relevant is deleted with 'strikethrough' function, while the changes to the text and information provided by RMS (LV) is highlighted in yellow shading.

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B.8 ENVIRONMENTAL FATE AND BEHAVIOUR AND ENVIRONMENTAL EXPOSURE ASSESSMENT

Introduction

The representative formulation supporting first inclusion and authorisation of zoxamide was RH-7281/mz75WP, which is wettable powder formulation containing 83 g/kg zoxamide and 667 g/kg mancozeb.

The representative formulation supporting the application for renewal approval of zoxamide is Zoxium 240 SC a suspension concentrate containing 240 g/l zoxamide.

Due to the change of representative formulation and GAPs a complete Annex III data package is provided. This assessment concerns only the formulation Zoxium 240 SC, which is non-systemic fungicide intended to control late blight on potatoes (*Phytophthora infestans*) and downy mildew on grapes (*Plasmopara viticola*). Zoxamide inhibits germ tube development and mycelium growth by inhibiting cell division.

The representative GAPs for the purposes of the AIR process are summarised in Table B.8-1.

Table B.8-1: Summary of the representative uses of Zoxium 240 SC

Crop Zone	**Pests or Group of pests controlled**	**Application**				**Application rate per treatment**		**PHI** days
		method kind	growth stage & season	number min max	interval between applications (min)	water l/ha min max	kg as/ha min max	
Potato All zones	Foliar fungi Late blight	Foliar spraying	BBCH 20-80	Max. 5	8 days	1000	0.15 – 0.18	7
Table and wine grapes Central and Southern EU	Foliar fungi Downy mildew	Foliar spraying	BBCH 15-79	Max.5	8 days	1000	0.15 – 0.18	28

B.8.1 Fate and behaviour in soil

B.8.1.1 Rate of degradation in soil

B.8.1.1.1 Laboratory studies

Environmental fate studies using the formulation Zoxium 240 SC were not conducted as data from studies with the active substance, zoxamide, are available and adequate to enable extrapolation to the behaviour of the formulated product. Neither the type of plant protection product nor its ingredients and physical properties are expected to affect the fate and behaviour in soil. Refer to Volume 3, CA, Section B.8 of RAR for details of aerobic degradation of the active substance in soil. In aerobic metabolism studies zoxamide degraded to a number of metabolites. The main metabolites being RH-127450, RH-24549, RH-163353 and RH-141455, which were detected at >5% AR at maximums of 15.1%, 33.8%, 15% and 8% AR, respectively. Laboratory DT_{50}s for zoxamide were 2.03 to 13.75 days at 10 to 25°C. Laboratory DT_{50}s for the metabolite RH-127450 were 1.99 to 11.69 days at 20°C. Laboratory DT_{50}s for the metabolite RH-24549 were 3.05 to 16.23 days at 20 to 25°C. Laboratory DT_{50}s for the metabolite RH-163353 were 5.62 to 53.65 days at 20°C. Laboratory DT_{50}s for the metabolite RH-141455 were 11.1 to 195.2 days at 20°C.

The possibility that anaerobic conditions are encountered after application is unlikely as the proposed applications to potatoes and vines will occur during the summer months.

In a photolysis study, degradation was observed in both the irradiated and dark control samples. Similar metabolites were identified as in the aerobic and anaerobic soil degradation studies, suggesting that degradation is primarily hydrolytic or microbial, rather than photolytic.

B.8.1.1.2 Field studies

Soil dissipation studies

Environmental fate studies using the formulation Zoxium 240 SC were not conducted as data from studies with the active substance, zoxamide, are available and adequate to enable extrapolation to the behaviour of the formulated product. Neither the type of plant protection product nor its ingredients and physical properties are expected to affect the fate and behaviour in soil.

The DT_{50} of zoxamide and its metabolites in laboratory aerobic soil degradation studies is <60 days, the threshold triggering the requirement for field dissipation studies. A DT_{50} of >60 days is obtained for the metabolite RH-141455 in a single soil treated with the parent compound. This DT_{50} may have been influenced by the low levels detected and the DT_{50}s in the study performed with the metabolite itself are significantly shorter and are <60 days. Therefore field studies are not triggered for either zoxamide or its metabolites. Refer to Volume 3, CA, Section B.8 of RAR for details of laboratory and field degradation of the active substance in soil.

Soil accumulation studies

Environmental fate studies using the formulation Zoxium 240 SC were not conducted as data from studies with the active substance, zoxamide, are available and adequate to enable extrapolation to the behaviour of the formulated product. Neither the type of plant protection product nor its ingredients and physical properties are expected to affect the fate and behaviour in soil.

The DT_{90} of zoxamide and its metabolites in laboratory aerobic soil degradation studies is <365 days, the threshold triggering the requirement for soil accumulation studies. A DT_{90} of >365 days is obtained for

the metabolite RH-141455 in a single soil treated with the parent compound. This DT_{90} may have been influenced by the low levels detected and the DT_{90}s in the study performed with the metabolite itself are significantly shorter and are <365 days. Field accumulation testing is therefore not necessary.

B.8.1.2 Mobility in soil

B.8.1.2.1 Laboratory studies

Environmental fate studies using the formulation Zoxium 240 SC were not conducted as data from studies with the active substance, zoxamide, are available and adequate to enable extrapolation to the behaviour of the formulated product. The type of formulation used in Zoxium 240 SC is not expected to affect the mobility in soil and data generated with the unformulated material are considered to be applicable to the formulation.

Kocs were 815 to 1431 ml/g for zoxamide, 447 to 1156 ml/g for RH-127450, 91 to 307 ml/g for RH-24549, 50 to 79 ml/g for RH-163353 and 2 to 3 ml/g for RH-141455. Refer to Volume 3, CA, Section B.8 of RAR for further information on mobility in soil.

B.8.1.2.2 Lysimeter studies

FOCUS groundwater modelling summarised under Point B.8.3 demonstrates that PECgw for zoxamide and its metabolites are below the relevant regulatory thresholds; lysimeter studies are therefore not necessary.

B.8.1.2.3 Field leaching studies

FOCUS groundwater modelling summarised under Point B.8.3 demonstrates that PEC_{gw} for zoxamide and its metabolites are below the relevant regulatory thresholds; field leaching studies are therefore not necessary.

B.8.2 Predicted environmental concentrations in soil (PEC_S)

PECs for Zoxium 240 SC in soil have been calculated according to FOCUS 1997[1] using crop interception values from FOCUS (2012)[2] and the soil DT_{50}s summarised at Volume 3, CA, Section B.8 of RAR.

Zoxium 240 SC is used in vines and potatoes at a maximum application rate of 0.18 kg a.s./ha. Up to a maximum of five applications may be made at a minimum interval of 8 days. Applications to potatoes are made between formation of side shoots (BBCH 20) and ripening (BBCH 80). Applications to vines are made between leaf development (five leaves unfolded, BBCH 15) and fruit development (majority of berries touching, BBCH 79).

PECs were calculated assuming that residues were evenly distributed through the upper 5 cm of soil with a bulk density of 1.5 g/cm³. The earliest timing to potatoes is BBCH 20, therefore crop interception of 50% was assumed in accordance with FOCUS (2012). For applications to vines the earliest application timing is BBCH 15, therefore crop interception of 60% was assumed in accordance with FOCUS (2012). Selected crop interception values are equal or lower compared to crop interception values proposed in EFSA guidance (2014).

For the modelling of the decline of the residues in soil ~~the maximum laboratory DT_{50} in soil of 13.75 days~~ slow phase DT_{50} in soil of 41.3 days (DFOP, ~~DT_{90} 107.1 days,~~ k1 = 0.22, k2 = 0.0168, g = 0.39) was used. The calculated PECs are detailed in Table B.8.2-1.

Table B.8.2-1: PECs for zoxamide in soil after application of Zoxium 240 SC to vines and potatoes

Days after application	Potatoes		Vines	
	PECsoil (mg/kg)	Time weighted Average PECsoil (mg/kg)	PECsoil (mg/kg)	Time weighted Average PECsoil (mg/kg)
0	~~0.277~~ 0.467	-	~~0.221~~ 0.374	-
1	~~0.253~~ 0.459	~~0.264~~ 0.463	~~0.202~~ 0.367	~~0.212~~ 0.370
2	~~0.233~~ 0.452	~~0.253~~ 0.459	~~0.186~~ 0.361	~~0.203~~ 0.367
4	~~0.203~~ 0.437	~~0.235~~ 0.452	~~0.162~~ 0.349	~~0.188~~ 0.361
7	~~0.173~~ 0.415	~~0.214~~ 0.441	~~0.139~~ 0.332	~~0.172~~ 0.352
21	~~0.120~~ 0.328	~~0.165~~ 0.394	~~0.096~~ 0.263	~~0.132~~ 0.315
28	~~0.106~~ 0.292	~~0.152~~ 0.373	~~0.085~~ 0.234	~~0.122~~ 0.298
50	~~0.073~~ 0.202	~~0.124~~ 0.316	~~0.058~~ 0.161	~~0.099~~ 0.253
100	~~0.031~~ 0.087	~~0.087~~ 0.226	~~0.025~~ 0.070	~~0.069~~ 0.181

The metabolites RH-127450, RH-24549, RH-163353 and RH-141455, were detected at >5% AR at maximums of 15.1%, 33.8%, 15% and 8% AR respectively, therefore PECs in soil have been calculated for these metabolites.

PECs for these metabolites have been calculated based on the assumptions given above. The PECs have been calculated by adjusting the maximum application rate of zoxamide for the difference in molecular weight and the maximum percentage formed to give an equivalent application rate. Possible degradation between applications was taken into account using the maximum laboratory DT_{50} in soil at 20°C. The input parameter used for the metabolites in the PECsoil calculations are given in Table B.8.2-2.

[1] Soil persistence models and EU registration, FOCUS , 29 February 1997

[2] FOCUS (2011). Generic guidance for Tier 1FOCUS groundwater assessments. Version 2.1, December 2012

Table B.8.2-2: Parameters used for the calculation of PECs for the metabolites of zoxamide in soil

Max indiv dose for zoxamide – 180 g a.s./ha, max total dose 900 g a.s./ha (mw 336.65)				
	RH-127450	**RH-24549**	**RH-163353**	**RH-141455**
Molar mass [g/mol]	302.15	205	332.15	235.02
Maximum in soil (%)	15.1	33.8	15	8*
Correction factor	0.136	0.206	0.148	0.056
Rate applied (g/ha)	5 x 24.5	5 x 37.1	5 x 26.6	5 x 10.1
DT_{50} in soil (days) at 20°C	11.69**	16.23	53.65***	195.2

* maximum in soil (%) of RH-141455 is 8.4 % (day 14) instead of 8 %, however updated PEC_{SOIL} for this metabolite are deemed not necessary since no significant impact on the risk assessment is expected

** longer DT_{50} - 17.8 days was obtained at 10°C

*** longer DT_{50} - 55.5 days was obtained at 10°C

The calculated PECs for the metabolites are given in Tables B.8.2-3 to B.8.2-6.

Table B.8.2-3: PECs for RH-127450 in soil after application of Zoxium 240 SC to vines and potatoes

Days after application	**Potatoes**		**Vines**	
	PECsoil (mg/kg)	**Time weighted Average PECsoil (mg/kg)**	**PECsoil (mg/kg)**	**Time weighted Average PECsoil (mg/kg)**
0	0.039	-	0.031	-
1	0.037	~~0.038*~~ 0.038	0.030	~~0.030*~~ 0.031
2	0.035	~~0.037*~~ 0.037	0.028	~~0.030*~~ 0.030
4	0.031	~~0.035*~~ 0.035	0.025	~~0.028*~~ 0.028
7	0.026	~~0.032*~~ 0.033	0.021	~~0.026*~~ 0.026
21	0.011	~~0.022*~~ 0.030	0.009	~~0.018*~~ 0.024
28	0.007	~~0.019*~~ 0.029	0.006	~~0.015*~~ 0.023
50	0.002	~~0.013*~~ 0.024	0.002	~~0.010*~~ 0.019
100	0.000	~~0.007*~~ 0.014	0.000	~~0.005*~~ 0.011

* TWA PECsoil have been calculated from the last application

Table B.8.2-4: PECs for RH-24549 in soil after application of Zoxium 240 SC to vines and potatoes

Days after application	**Potatoes**		**Vines**	
	PECsoil (mg/kg)	**Time weighted Average PECsoil (mg/kg)**	**PECsoil (mg/kg)**	**Time weighted Average PECsoil (mg/kg)**
0	0.070	-	0.056	-
1	0.067	~~0.069*~~ 0.069	0.054	~~0.055*~~ 0.055
2	0.064	~~0.067*~~ 0.067	0.051	~~0.054*~~ 0.054
4	0.059	~~0.064*~~ 0.064	0.047	~~0.051*~~ 0.052
7	0.052	~~0.060*~~ 0.061	0.042	~~0.048*~~ 0.049

Days after application	Potatoes		Vines	
	PECsoil (mg/kg)	Time weighted Average PECsoil (mg/kg)	PECsoil (mg/kg)	Time weighted Average PECsoil (mg/kg)
21	0.029	~~0.046*~~ 0.055	0.023	~~0.037*~~ 0.044
28	0.021	~~0.041*~~ 0.053	0.017	~~0.033*~~ 0.042
50	0.008	~~0.029*~~ 0.045	0.007	~~0.023*~~ 0.036
100	0.001	~~0.016*~~ 0.029	0.001	~~0.013*~~ 0.023

* TWA PECsoil have been calculated from the last application

Table B.8.2-5: PECs for RH-163353 in soil after application of Zoxium 240 SC to vines and potatoes

Days after application	Potatoes		Vines	
	PECsoil (mg/kg)	Time weighted Average PECsoil (mg/kg)	PECsoil (mg/kg)	Time weighted Average PECsoil (mg/kg)
0	0.073	-	0.058	-
1	0.072	~~0.072*~~ 0.072	0.058	~~0.058*~~ 0.058
2	0.071	~~0.072*~~ 0.072	0.057	~~0.058*~~ 0.058
4	0.069	~~0.071*~~ 0.071	0.055	~~0.057*~~ 0.057
7	0.067	~~0.070*~~ 0.070	0.053	~~0.056*~~ 0.056
21	0.056	~~0.064*~~ 0.064	0.044	~~0.051*~~ 0.051
28	0.051	~~0.061*~~ 0.063	0.041	~~0.049*~~ 0.050
50	0.038	~~0.054*~~ 0.057	0.031	~~0.043*~~ 0.046
100	0.020	~~0.041*~~ 0.046	0.016	~~0.033*~~ 0.037

* TWA PECsoil have been calculated from the last application

Table B.8.2-6: PECs for RH-141455 in soil after application of Zoxium 240 SC to vines and potatoes

Days after application	Potatoes		Vines	
	PECsoil (mg/kg)	Time weighted Average PECsoil (mg/kg)	PECsoil (mg/kg)	Time weighted Average PECsoil (mg/kg)
0	0.032	-	0.025	-
1	0.032	~~0.032*~~ 0.032	0.025	~~0.025*~~ 0.025
2	0.032	~~0.032*~~ 0.032	0.025	~~0.025*~~ 0.025
4	0.031	~~0.032*~~ 0.032	0.025	~~0.025*~~ 0.025
7	0.031	~~0.031*~~ 0.031	0.025	~~0.025*~~ 0.025
21	0.030	~~0.031*~~ 0.031	0.024	~~0.025*~~ 0.025
28	0.029	~~0.030*~~ 0.030	0.023	~~0.024*~~ 0.024
50	0.027	~~0.029*~~ 0.029	0.021	~~0.023*~~ 0.023
100	0.022	~~0.027*~~ 0.027	0.018	~~0.021*~~ 0.022

* TWA PECsoil have been calculated from the last application

Table B.8.2-7: PECsoil,accumulation for RH-141455 in soil after multi-year application of Zoxium 240 SC to vines and potatoes

Crop	$PEC_{soil,accumulation}$, 0-5 cm (mg/kg)	
	No tillage	Tillage (mixing depth: 0-20 cm)
Potatoes	0.0505*	0.0366*
Vines	0.0404*	0.0293*

* obtained after 4 years

RMS comment:

The RMS believes it would be more appropriate to use slow phase DT_{50} (41.3 days) for calculations of PEC_{soil} for zoxamide as calculations with fast phase DT_{50} (13.75 days) results in underestimated concentrations. Therefore, the RMS recalculated PEC_{soil} for zoxamide (see Table B.8.2-1), meanwhile, notifiers PEC_{soil} calculations for metabolites of zoxamide are considered acceptable. In addition, a question was raised whether time weighted average (TWA) PEC_{soil} calculated with moving time frame could not be higher than $PEC_{soil,twa}$ calculated from the last application. Given the above, the RMS recalculated $PEC_{soil,actual}$ and $PEC_{soil,twa}$ for zoxamide and did additional $PEC_{soil,twa}$ calculations for metabolites. Calculations were conducted with modelling tool ESCAPE (v.2.0) considering slow phase DT_{50} (41.3 days) for zoxamide and moving time frame for calculations of $PEC_{soil,twa}$. As calculations with moving time frame gave higher $PEC_{soil,twa}$ values, especially for metabolites RH-127450 and RH-24549, old values were replaced by the new ones – obtained by RMS.

Additionally, as the metabolite RH-141455 is persistent in soil (DT_{90} > 365 d), accumulation calculations were undertaken by RMS. Calculations were performed using modelling tool ESCAPE (v.2.0) and considering following sequence: parent and two metabolites (Zoxamide → RH-24549 → RH-141455). Same application data and substance-specific input parameters as for short- and long-term PECsoil calculations were considered, except for formation fraction values which were obtained from endpoints of groundwater assessment, see Table. B.8.3-1. Both "no tillage" and "tillage" was considered for accumulation calculations, see Table B.8.2-7.

The predicted concentrations in soil are appropriate for the subsequent risk assessment for soil organisms.

B.8.3 Predicted environmental concentrations in ground water (PEC_{GW})

Reference:	Callow B., Montesano V. (2015a). Predicted environmental concentrations of zoxamide and its metabolites in groundwater in the EU using the FOCUS PELMO 5.5.3 and FOCUS PEARL 4.4.4 models.
Guideline(s):	FOCUS (2000, 2014)
GLP:	No (calculation - GLP is not relevant)
Previous evaluation:	Submitted for the purpose of renewal
Validity of the study:	Considered acceptable

Executive Summary

Predicted Environmental Concentrations in groundwater have been calculated for zoxamide and its metabolites RH-24549, RH-163353, RH-127450 and RH-141455 using the FOCUS groundwater scenarios and the PELMO 5.5.3 and PEARL 4.4.4. models. Potatoes and vines (5 applications of 180 g a.s./ha) were used for the simulations. For vines, 60% crop interception was considered for all applications. For potatoes, 60% crop interception was considered for the first, second and third application with 85% for the fourth and fifth application. Application both every year and once every three years was considered for potatoes. Application was simulated from 28 days after emergence for both crops. DT_{50}s of 6.4 days, 4.3 days, 7.5 days, 10.3 days and 23.9 days were assumed for zoxamide, RH-127450, RH-24549, RH-163353 and RH-141455 respectively. Respective K_{oc}s of 1224 ml/g, 669 ml/g, 90.5 ml/g, 68 ml/g and 2.8 ml/g were used. Predicted environmental concentration of zoxamide, RH-24549, RH-163353 and RH-127450 were << 0.1 µg/l in all scenarios for the different crops using both models. Predicted environmental concentrations of RH-141455 were above the threshold value of 0.1 µg/L in all scenarios for vines using both models. The values were from 0.356 to 2.596 µg/l. For potatoes, using application every year, the PEC values were above 0.1 µg/l in all scenarios, except for the Sevilla scenario, with both models. The values were from 0.041 to 3.478 µg/l. For potatoes, using application every 3 years, the PEC values were above 0.1 µg/L in all scenarios, except for the Porto, Sevilla and Thiva scenarios, with the PELMO model. The values were from 0.032 to 1.014 µg/l. With the PEARL model, the PEC values did not exceed the threshold value in the Porto and Sevilla scenarios, and only marginally exceeded this threshold in the Thiva scenario. The values were from 0.022 to 1.201 µg/l.

I. MATERIAL AND METHODS

Predicted Environmental Concentrations in groundwater were calculated for zoxamide and its metabolites using the FOCUS groundwater scenarios (FOCUS, 2000, 2014)[3,4] and the PELMO 5.5.3 and PEARL 4.4.4 models.

The agronomic parameters used as input for the simulations were as follows:

Crop:	Potato
FOCUS Crop:	Potato
Application Rate:	5 x 180 g a.s./ha (8 days interval)
Application timing:	First application 28 days after emergence
Crop Interception:	First/Second/Third application: 60%
	Fourth/Fifth application: 85%

Application every year and every three years were simulated.

Crop:	Vines
FOCUS Crop:	Vines
Application Rate:	5 x 180 g a.s./ha (8 days interval)
Application timing:	First application 28 days after emergence
Crop Interception:	All applications: 60%

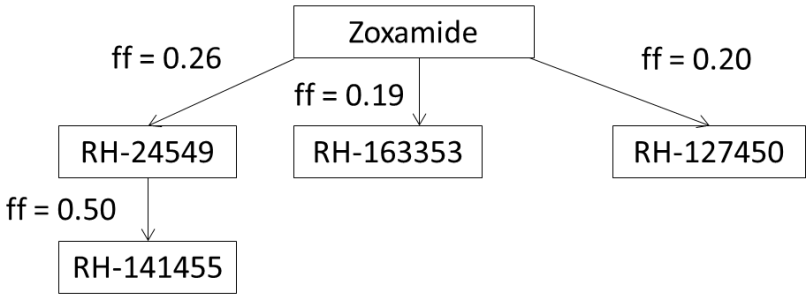
[3] FOCUS (2000). FOCUS groundwater scenarios in the EU review of active substances - The report of the work of the Groundwater Scenarios Workgroup of FOCUS (FOrum for the Co-ordination of pesticide fate models and their USe), Version 1 of November 2000. EC Document Reference Sanco/321/2000 rev.2.

[4] FOCUS (2014). Generic guidance for Tier 1 FOCUS ground water assessments. Version 2. 2, May 2014.

Where possible, crop interception percentages were determined according to FOCUS guidance (2014).

The metabolism of zoxamide in soil is complex leading to the formation of numerous minor metabolites. For modelling purposes a simplification of the metabolic pathway was used. The metabolism scheme used in the simulations is given Figure B.8.3-1.

Figure B.8.3-1: Metabolism scheme used in the simulations



The chemical input parameters used in the modelling are summarised in Table B.8.3-1.

Table B.8.3-1: Input parameters used in the FOCUS groundwater modelling

End-Point	Zoxamide	RH-127450	RH-24549	RH-163353	RH-141455
Molecular Weight (g/mol)	336.65	302.15	205	332.15	235.02
Water Solubility, 20°C (mg/L)	0.681	1000	1000	1000	1000
Vapour pressure, 25°C (Pa)	1.3×10^{-5}	0	0	0	0
K_{oc} / K_{om} (L/kg) – arith. mean	1224/710	669/388	90.5/52.5*	68/39	2.8/1.6
Freundlich exponent, 1/n – arith. mean	0.973	0.9†	0.811	0.892	1.0**
DT_{50} in Soil (days) – geom. mean	6.4	4.3	7.5	10.3	23.9
Crop uptake factor	0	0	0	0	0
Formation fraction – arith. mean	-	0.20 (from zoxamide)	0.26 (from zoxamide)	0.19 (from zoxamide)	0.50 (from RH-24549)

* worst case as adsorption is pH dependent.

** Adsorption of RH-141455 on soil was very low and therefore no desorption kinetics and adsorption/desorption isotherms were determined; hence a Freundlich exponent of 1 was used.

† The measured Freundlich exponent of 0.523 was considered unreliable so the default value was used.

Table B.8.3-2: Summary of the modelling rates of degradation of zoxamide normalised to 20°C and pF2 - Burgener (1998) and Smalley et al (1997)

Soil	DT_{50} (days)	Temp	T-Corr	Moist. Cont. (%)	Moist. Corr	*DT_{50} normalised to 20°C & pF2
England silt loam 20°C 50%MWHC	4.16	20˚C	1.00	20.4	0.84	3.51
France loam 20°C 50%MWHC	2.03	20˚C	1.00	22.8	0.94	1.90
Italy clay loam 20°C 50%MWHC	2.38	20˚C	1.00	21.3	0.83	1.97

Germany sandy loam 20°C 50%MWHC	2.7	20˚C	1.00	18.7	0.99	2.67
Germany sandy loam 20°C 100%FC	2.27	20˚C	1.00	22.7	1.00	2.27
Pennsylvania silt loam 25°C 75%FC	39.2	25˚C	1.57	16.95	0.74	45.60
Ohio loamy sand 25°C 75%FC	41.3	25˚C	1.57	7.35	0.71	45.99
Geometric mean*						**6.4**

* for the calculation of the geometric mean value the mean value of the two Germany sandy loam at 20°C is considered.

Table B.8.3-3: Summary of the modelling rates of degradation of RH-127450 normalised to 20°C and pF2 - Burgener (1998)

Soil	DT_{50} (days)	Temp	T-Corr	Moist. Cont. (%)	Moist. Corr	*DT_{50} normalised to 20°C & pF2
England silt loam 20°C 50%MWHC	11.69	20˚C	1.00	20.4	0.84	9.86
France loam 20°C 50%MWHC	3.78	20˚C	1.00	22.8	0.94	3.54
Italy clay loam 20°C 50%MWHC	1.99	20˚C	1.00	21.3	0.83	1.64
Germany sandy loam 20°C 50%MWHC	6.66	20˚C	1.00	18.7	0.99	6.59
Germany sandy loam 20°C 100%FC	5.76	20˚C	1.00	22.7	1.00	5.76
Geometric mean						**4.3**

* for the calculation of the geometric mean value the mean value of the two Germany sandy loam at 20°C is considered.

Table B.8.4-4: Summary of the modelling rates of degradation of RH-24549 normalised to 20°C and pF2 - Burgener (1998) and Smalley et al (1997)

Soil	DT_{50} (days)	Temp	T-Corr	Moist. Cont. (%)	Moist. Corr	*DT_{50} normalised to 20°C & pF2
France loam 20°C 50%MWHC	6.29	20˚C	1.00	22.8	0.94	5.90
Italy clay loam 20°C 50%MWHC	8.44	20˚C	1.00	21.3	0.83	6.97
Germany sandy loam 20°C 50%MWHC	5.35	20˚C	1.00	18.7	0.99	5.29
Germany sandy loam 20°C 100%FC	3.05	20˚C	1.00	22.7	1.00	3.05
Ohio loamy sand 25°C 75%FC	16.23	25˚C	1.57	7.35	0.71	18.07
Geometric mean						**7.5**

* for the calculation of the geometric mean value the mean value of the two Germany sandy loam at 20°C is considered.

Table B.8.5-5: Summary of the modelling rates of degradation of RH-163353 normalised to 20°C and pF2 - Burgener (1998)

Soil	DT_{50} (days)	Temp	T-Corr	Moist. Cont. (%)	Moist. Corr	*DT_{50} normalised to 20°C & pF2
England silt loam 20°C 50%MWHC	53.65	20˚C	1.00	20.4	0.84	45.27
France loam 20°C 50%MWHC	6.62	20˚C	1.00	22.8	0.94	6.21
Italy clay loam 20°C 50%MWHC	6.39	20˚C	1.00	21.3	0.83	5.28
Germany sandy loam 20°C 50%MWHC	5.62	20˚C	1.00	18.7	0.99	5.56
Germany sandy loam 20°C 100%FC	9.9	20˚C	1.00	22.7	1.00	9.90
Geometric mean						**10.3**

* for the calculation of the geometric mean value the mean value of the two Germany sandy loam at 20°C is considered.

Table B.8.6-6: Summary of the modelling rates of degradation of RH-141455 normalised to 20°C and pF2 - Burgener (1998) and van den Bosch (2013)

Soil	DT_{50} (days)	Temp	T-Corr	Moist. Cont. (%)	Moist. Corr	DT_{50} normalised to 20°C & pF2
Germany sandy loam 20°C 50%MWHC	195.2	20˚C	1.00	18.7	0.99	193.04
Speyer 2.2 20°C loamy sand	12	20 ˚C	1.00	17	1.00	12.00
Speyer 2.3 20°C sandy loam	11.1	20 ˚C	1.00	15.3	0.86	9.54
Speyer 6S 20°C clay	31.7	20 ˚C	1.00	16.1	0.46	14.72
Geometric mean						**23.9**

The value for the Q10 was set to 2.58 and the moisture exponent was set to 0.7 in line with FOCUS guidance. Other pesticide related inputs and assumptions regarding the adjustment of the degradation rate with depth were set to FOCUS defaults.

II. RESULTS AND DISCUSSION

The results are given in Tables 8.3-7 to 8.3-11. Predicted environmental concentrations of zoxamide, RH-24549, RH-163353 and RH-127450 were << 0.1 µg/l in all scenarios for the different crops using both models. Predicted environmental concentrations of RH-141455 were above the threshold value of 0.1 µg/L in all scenarios for vines using both models, with values from 0.356 to 2.596 µg/l. For potatoes (every year), the PEC values were above 0.1 µg/l in all scenarios, except for the Sevilla scenario, using both models. The values were from 0.041 to 3.478 µg/l. For potatoes (every 3 years), the PEC values were above 0.1 µg/l in all scenarios, except for the Porto, Sevilla and Thiva scenarios, with the PELMO model. The values were from 0.032 to 1.014 µg/l. With the PEARL model, the PEC values did not exceed the threshold value in the Porto and Sevilla scenarios, and only marginally exceeded this threshold in the Thiva scenario. The values were from 0.022 to 1.201 µg/l.

Table B.8.3-7: **PEC_{gw} (µg/l) values for zoxamide after application to potatoes and vines using PEARL and PELMO model**

Zoxamide						
Crop	**Potatoes**				**Vines**	
Model	**PEARL [µg/l]**		**PELMO [µg/l]**		**PEARL [µg/l]**	**PELMO [µg/l]**
Application Scenario	**every year**	**every 3 years**	**every year**	**every 3 years**	**every year**	
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	-	-
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	-	-
Piacenza	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Thiva	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table B.8.3-8: **PEC_{gw} (µg/l) values for RH-24549 after application of zoxamide to potatoes and vines using PEARL and PELMO model**

RH-24549						
Crop	**Potatoes**				**Vines**	
Model	**PEARL [µg/l]**		**PELMO [µg/l]**		**PEARL [µg/l]**	**PELMO [µg/l]**
Application Scenario	**every year**	**every 3 years**	**every year**	**every 3 years**	**every year**	
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	-	-
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	-	-
Piacenza	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Thiva	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table B.8.3-9: **PEC_{gw} (µg/l) values for RH-163353 after application of zoxamide to potatoes and vines using PEARL and PELMO model**

RH-163353						
Crop	**Potatoes**				**Vines**	
Model	**PEARL [µg/l]**		**PELMO [µg/l]**		**PEARL [µg/l]**	**PELMO [µg/l]**
Application Scenario	**every year**	**every 3 years**	**every year**	**every 3 years**	**every year**	
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	-	-
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	-	-
Piacenza	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Thiva	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table B.8.3-10: **PEC_{gw} (µg/l) values for RH-127450 after application of zoxamide to potatoes and vines using PEARL and PELMO model**

RH-127450						
Crop	**Potatoes**				**Vines**	
Model	**PEARL [µg/l]**		**PELMO [µg/l]**		**PEARL [µg/l]**	**PELMO [µg/l]**
Application Scenario	**every year**	**every 3 years**	**every year**	**every 3 years**	**every year**	
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	-	-
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	-	-
Piacenza	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Thiva	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table B.8.3-11: PEC_{gw} (µg/l) values for RH-141455 after application of zoxamide to potatoes and vines using PEARL and PELMO model

RH-141455						
Crop	**Potatoes**				**Vines**	
Model	**PEARL [µg/l]**		**PELMO [µg/l]**		**PEARL [µg/l]**	**PELMO [µg/l]**
Application Scenario	**every year**	**every 3 years**	**every year**	**every 3 years**	**every year**	
Châteaudun	0.822	0.317	0.647	0.225	1.641	1.244
Hamburg	2.772	0.820	1.613	0.558	2.596	2.331
Jokioinen	3.478	1.201	3.164	1.014	-	-
Kremsmünster	1.203	0.433	1.169	0.437	1.350	1.632
Okehampton	1.136	0.417	0.899	0.341	-	-
Piacenza	0.402	0.151	0.421	0.119	0.667	0.747
Porto	0.157	0.047	0.308	0.096	0.368	0.522
Sevilla	0.041	0.022	0.071	0.032	0.662	0.356
Thiva	0.259	0.101	0.187	0.079	0.464	0.399

II. CONCLUSION

Predicted environmental concentrations in groundwater of zoxamide, RH-24549, RH-163353 and RH-127450 were << 0.1 µg/l in all scenarios for the different crops using both models. Predicted environmental concentrations of RH-141455 were above the threshold value of 0.1 µg/L in all scenarios for vines using both models (0.356 to 2.596 µg/l). For potatoes, after application every year, the PEC values were above 0.1 µg/l in all scenarios, except for the Sevilla scenario, with both models (0.041 to 3.478 µg/l). For potatoes, after application every 3 years, the PEC values were above 0.1 µg/L in all scenarios, except for the Porto, Sevilla and Thiva scenarios, with the PELMO model (0.032 to 1.014 µg/l). With the PEARL model, the PEC values did not exceed the threshold value in the Porto and Sevilla scenarios, and only marginally exceeded this threshold in the Thiva scenario (0.022 to 1.201 µg/l). The calculated values for zoxamide, RH-24549, RH-163353 and RH-127450 are lower than 0.1 µg/l and though PECgw for RH-141455 exceed this threshold, PECgw for this metabolite are <10 µg/l and data are available which demonstrate the metabolite to be non-relevant. There is therefore a negligible risk to groundwater from the proposed use.

RMS comment:

Predicted environmental concentrations in groundwater (PEC_{gw}) of zoxamide, RH-24549, RH-163353 and RH-127450 are below the trigger value of 0.1 µg/l for both potatoes and vines in all scenarios with FOCUS PEARL 4.4.4 and FOCUS PELMO 5.5.3. PEC_{gw} of RH-141455 exceed the trigger value for both

crops in all scenarios, except for the Sevilla scenario for potatoes, using the PEARL model. Though PEC_{gw} for RH-141455 exceed the threshold of 0.1 µg/l, PEC_{gw} for this metabolite is <10 µg/l and data are available which demonstrate the metabolite to be non-relevant. The study (PEC_{gw} modelling) is considered acceptable.

B.8.4 Fate and behaviour in water and sediment

B.8.4.1 Aerobic mineralisation in surface water

Environmental fate studies using the formulation Zoxium 240 SC were not conducted as data from studies with the active substance, zoxamide, are available and adequate to enable extrapolation to the behaviour of the formulated product. Neither the type of plant protection product nor its ingredients and physical properties are expected to affect the fate and behaviour in water or sediment. Refer to Volume 3, CA, Section B.8 of RAR for details of the aerobic mineralisation study with the active substance.

In the aerobic aquatic mineralisation study zoxamide degraded rapidly to non-detectable levels after 28 days with SFO DT_{50}s of 7.6 to 8.4 days. A number of metabolites were detected above the relevant thresholds. RH-141455, RH-139432, RH-141288, RH-163353, RH-24549 and M-7 were detected at >5% on two consecutive occasions at respective maximums of 10.5% AR, 21.4% AR, 22.1% AR, 47.9% AR, 22.7% AR and 9.1% AR.

B.8.4.2 Water/sediment study

Environmental fate studies using the formulation Zoxium 240 SC were not conducted as data from studies with the active substance, zoxamide, are available and adequate to enable extrapolation to the behaviour of the formulated product. Neither the type of plant protection product nor its ingredients and physical properties are expected to affect the fate and behaviour in water or sediment. Refer to Volume 3, CA, Section B.8 of RAR for details of the water/sediment study with the active substance.

In water/sediment studies with zoxamide conducted at 20°C and 10°C, zoxamide degraded with whole system DT_{50}s of 6.3 to 6.4 days at 20°C and 10.4 to 19.4 days at 10°C. Zoxamide dissipated rapidly from water with 1st order DT_{50}s of 3-6 days (river) and 3-11 days (pond), at 20 and 10°C respectively. In sediment, zoxamide increased to a maximum of 13-26% AR (river, day 7-14) and 23-30 % AR (pond, day 7), then declined with DT_{50}s of 0.8-16 days (river) and 10-19 days (pond). Metabolites were similar to those found in soil and levels were all <10% AR except for RH-127450 (max. 17% AR (day 28) and 23% AR (day 56) in water and sediment respectively) and RH-163353 (max 16% AR (day 28) and 13.8% AR (day 106) in water and sediment respectively). RH-127450 degraded with whole system DT_{50}s of 88.9 to 326.1 days at 20°C and 123 days at 10°C. DT_{50}s for RH-163353 could not be calculated. The extent of mineralisation was similar in river and pond systems and was higher at 20°C (20-22% AR) than at 10°C (4-6.5% AR).

B.8.4.3 Irradiated water/sediment study

Photolysis of zoxamide is not considered to be a major route of degradation in the aquatic environment, therefore an irradiated water/sediment study is not necessary.

B.8.5 Predicted environmental concentrations in surface water and sediment (PEC_{SW}, PEC_{SD})

PEC_{sw} for zoxamide and its metabolites were calculated according to the FOCUS surface water guidance document[5]. The FOCUS surface water scenarios provide a standard assessment tool to examine the potential surface water exposure by pesticides. This tool is divided into four steps which aim to increase in realism as the tiers rise. At Step 1 inputs of spray drift, run-off, erosion and/or drainage are assumed to occur as a single worst-case loading. Step 2 accounts for a more realistic loading based on sequential application patterns and the run-off/erosion/drainage event is assumed to occur four days after the last application and is based on the region of use (N or S EU). At Step 3 ten representative scenarios have been developed using crop, climate and soil data for locations within the EU. These aim to provide a realistic worst case for surface water exposure within the EU. Step 4 allows for mitigation approaches to reduce surface water exposure.

Application of zoxamide is to be made in potatoes and vines. FOCUS Step 1 and 2 PEC_{sw} were initially calculated using the STEPS 1-2 in FOCUS calculator. The agronomic assumptions used for the calculations are given in Table B.8.5-1.

Table B.8.5-1: Agronomic inputs used for zoxamide and its metabolites in the calculation of FOCUS Step 1 and 2 PECsw and PECsed

Parameter	Value
Rate (g a.s./ha)	180
Number of applications	5
Interval between applications (days)	8 days
Crop type	Potatoes, Vines (early application), Vines (late application)
Crop interception	Potatoes - average crop cover Vines (early application) – minimal crop cover Vines (late application) – full crop cover
Region and season of application	Potatoes - N & S EU June-Sept Vines (early application) – N & S EU Mar-May Vines (late application) - N & S EU June-Sept

The standard assumptions made by the FOCUS Step 1 and 2 calculations are given in Table B.8.5-2 and the test substance parameters used in the calculations are given in Table B.8.5-3.

[5] 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.

Table B.8.5-2: Standard assumptions used in the FOCUS Step 1 and 2 calculations

Parameter	Value
Distance to the water body (m)	Potatoes - Step 1 & 2 – 1 Vines (early & late) - 3
Runoff + drainage (% of application)	Step 1 (all crops) - 10 Step 2 - Potatoes – 2 (N EU) 3 (S EU) Step 2 - Vines (early application) - 2 (N EU) 4 (S EU) Step 2 - Vines (late application) - 2 (N EU) 3 (S EU)
Spraydrift (% of application)	Step 1 & Step 2 Potatoes –– 1.794 (multiple), 2.759 (single) Vines (early application) – 2.398 (multiple), 2.699 (single) Vines (late application) – 6.636 (multiple), 8.028 (single)
Ratio of field to water body	Step 1 & 2 - 10
Water depth (cm)	Step 1 & 2 - 30
Sediment depth (cm)	Step 1 & 2 - 5
Effective sediment depth for sorption (cm)	Step 1 & 2 - 1.00
Sediment OC (%):	Step 1 & 2 - 5.00
Sed. bulk density (kg/L):	Step 1 & 2 - 0.80

Table B.8.5-3: Input parameters used for zoxamide and its metabolites in the FOCUS Step 1 and 2 calculations

End-Point	Zoxamide	RH-127450	RH-24549	RH-163353	RH-141455	RH-141288	RH-139432
Molecular Weight (g/mol)	336.65	302.15	205	332.15	~~265.09~~ 235.02	318.19	204.06
Water Solubility, 20°C (mg/L)	0.681	1000^{+}	1000^{+}	1000^{+}	1000^{+}	1000^{+}	1000^{+}
Koc / Kom (L/kg) – arith. mean	1224/710	669/388	183/106	68/39	2.8/1.6	10^{+}	10^{+}
DT50 in Soil (days) – geom. mean	6.4	4.3	7.5	10.3	23.9	1000^{+}	1000^{+}
DT50 whole system (days) – arithmetic. mean*	6.4	237	1000^{+}	1000^{+}	1000^{+}	1000^{+}	1000^{+}
DT50 water (days)	6.4**	237**	1000^{+}	1000^{+}	1000^{+}	1000^{+}	1000^{+}
DT50 sed (days)	6.4**	237**	1000^{+}	1000^{+}	1000^{+}	1000^{+}	1000^{+}
Max. occurrence in soil (%)	-	15.1	33.8	15	8.0	-	4.9
Max. occurrence in water/sed system or OECD 309 study (%)	-	39.3***	- 22.7	47.9	- 10.5	22.1	42.4

*Arithmetic mean are used as are more conservative than the respective geometric mean.

** Following the Generic guidance for FOCUS surface water Scenarios (2012) and SANCO/10058/2005, DT_{50} whole system must be assigned to both compartments in STEP 2, and in case that STEP 3 is required, for those compounds with 100<Koc <2000, then two simulations need to be run assigning DT_{50} whole system to the water compartment and 1000 days (default) to the sediment compartment and vice versa; only the highest PECs need to be considered for risk assessment.

***As worst case scenario, the higher value obtained when the system was incubated at 10°C is used for the simulations.

+worst case default in absence of measured value.

The calculated initial FOCUS Step 1 and 2 PECsw and PECsed are summarised in Table B.8.5-4 and the full PECs are given in Tables B.8.5-5 to B.8.5-67.

Table B.8.5-4: Summary of FOCUS Step 1 and 2 PECsw and PECsed for zoxamide and its metabolites

Crop	Step	Region	Zoxamide	RH-127450	RH-24549	RH-163353	RH-141455	RH-141288	RH-139432
PECsw (µg/L)									
Potatoes	Step 1	-	122.3	24.4	~~49.6~~ 50.8	44.6	~~18.8~~ 17.3	1.73	10.92
	Step 2	N EU	3.09	1.43	~~1.28~~ 1.91	3.76	~~1.11~~ 1.37	1.1	2.22
		S EU	4.35	1.59	~~1.92~~ 2.55	4.46	~~1.67~~ 1.87	1.1	2.65
Vines - early	Step 1	-	122.1	24.3	~~49.6~~ 50.8	44.5	~~18.8~~ 17.3	1.69	10.87
	Step 2	N EU	3.78	1.87	~~1.53~~ 2.38	4.83	~~1.33~~ 1.70	1.5	2.85
		S EU	6.8	2.25	~~3.07~~ 3.92	6.51	~~2.67~~ 2.88	1.5	3.89
Vines - late	Step 1	-	138.1	30.0	~~49.6~~ 53.0	52.1	~~18.8~~ 18.5	5.03	14.98
	Step 2	N EU	5.32	4.73	~~0.76~~ 3.10	9.59	~~0.68~~ 2.03	4.08	5.52
		S EU	5.32	4.73	~~1.15~~ 3.49	10.0	~~1.0~~ 2.32	4.08	5.78
PECsed (µg/kg dry sediment)									
Potatoes	Step 1	-	1.4E03	153.6	~~90.8~~ 90.8	30.1	~~0.53~~ 0.47	0.17	0.88
	Step 2	N EU	35.4	8.39	~~2.34~~ 3.42	2.51	~~0.03~~ 0.04	0.11	0.22
		S EU	50.9	9.43	~~3.51~~ 4.59	2.98	~~0.05~~ 0.05	0.11	0.26
Vines - early	Step 1	-	1.4E03	153.4	~~90.8~~ 90.8	30.0	~~0.53~~ 0.47	0.17	0.88
	Step 2	N EU	43.2	10.9	~~2.81~~ 4.25	3.23	~~0.04~~ 0.05	0.15	0.28
		S EU	80.1	13.4	~~5.62~~ 7.06	4.36	~~0.07~~ 0.08	0.15	0.39
Vines - late	Step 1	-	1.4E03	173.3	~~90.8~~ 90.8	34.8	~~0.53~~ 0.47	0.50	0.88
	Step 2	N EU	35.6	24.6	~~1.41~~ 5.39	6.35	~~0.02~~ 0.06	0.40	0.55
		S EU	44.9	25.2	~~2.11~~ 6.10	6.63	~~0.03~~ 0.06	0.40	0.58

Table B.8.5-5: FOCUS Step 1 PECsw and PECsed for zoxamide after application to potatoes

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	122.2588	---	1.4E+03	---
1	105.1040	113.6814	1.29E+03	1.34E+03
2	94.3156	106.6469	1.15E+03	1.28E+03
4	75.9472	95.7235	929.5931	1.16E+03
7	54.8787	82.4892	671.7151	1.E+03
14	25.7130	60.4799	314.7267	736.6558
21	12.0476	46.3283	147.4626	564.6463
28	5.6448	36.8576	69.0924	449.3280
42	1.2392	25.5403	15.1680	311.4067
50	0.5210	21.5864	6.3773	263.2049
100	0.0023	10.8411	0.0284	132.1887

Table B.8.5-6: FOCUS Step 1 PECsw and PECsed for zoxamide after application to vines (early application)

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	122.0788	---	1.4E+03	---
1	105.0426	113.5607	1.29E+03	1.34E+03
2	94.2605	106.5575	1.15E+03	1.28E+03
4	75.9028	95.6540	929.0504	1.16E+03
7	54.8466	82.4333	671.3229	1.E+03
14	25.6979	60.4407	314.5429	736.2548
21	12.0406	46.2987	147.3765	564.3360
28	5.6415	36.8341	69.0521	449.0802
42	1.2385	25.5241	15.1591	311.2346
50	0.5207	21.5728	6.3736	263.0594
100	0.0023	10.8342	0.0284	132.1156

Table B.8.5-7: FOCUS Step 1 PECsw and PECsed for zoxamide after application to vines (late application)

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	138.0658	---	1.4E+03	---
1	110.4933	124.2795	1.35E+03	1.37E+03
2	99.1516	114.4998	1.21E+03	1.33E+03
4	79.8414	101.8240	977.2583	1.21E+03
7	57.6926	87.4001	706.1575	1.05E+03
14	27.0314	63.9217	330.8644	771.8732
21	12.6653	48.9309	155.0238	591.8954
28	5.9342	38.9178	72.6352	471.0900
42	1.3028	26.9634	15.9457	326.5226
50	0.5477	22.7887	6.7043	275.9855
100	0.0024	11.4447	0.0298	138.6090

Table B.8.5-8: FOCUS Step 1 PECsw and PECsed for RH-127450 after application to potatoes

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	24.4087	---	143.7630	---
1	22.9651	23.6869	153.6362	148.6996
2	22.8980	23.3092	153.1875	151.0557
4	22.7644	23.0702	152.2941	151.8980
7	22.5656	22.8965	150.9637	151.7823
14	22.1083	22.6163	147.9045	150.6056
21	21.6603	22.3721	144.9073	149.2040
28	21.2213	22.1391	141.9708	147.7615
42	20.3700	21.6903	136.2752	144.8755
50	19.8989	21.4412	133.1237	143.2464
100	17.1918	19.9768	115.0130	133.5470

Table B.8.5-9: FOCUS Step 1 PECsw and PECsed for RH-127450 after application to vines (early application)

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	24.3453	---	143.7630	---
1	22.9316	23.6384	153.4124	148.5877
2	22.8646	23.2683	152.9644	150.8880
4	22.7313	23.0331	152.0722	151.7029
7	22.5327	22.8611	150.7438	151.5761
14	22.0761	22.5824	147.6890	150.3936
21	21.6287	22.3388	144.6962	148.9916
28	21.1904	22.1063	141.7640	147.5500
42	20.3403	21.6584	136.0766	144.6669
50	19.8699	21.4097	132.9297	143.0398
100	17.1667	19.9475	114.8454	133.3535

Table B.8.5-10:FOCUS Step 1 PECsw and PECsed for RH-127450 after application to vines (late application)

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	29.9843	---	143.7630	---
1	25.9033	27.9438	173.2934	158.5282
2	25.8277	26.9047	172.7873	165.7842
4	25.6771	26.3285	171.7796	169.0336
7	25.4528	26.0012	170.2790	169.8884
14	24.9370	25.5976	166.8283	169.2181
21	24.4316	25.2929	163.4476	167.8561
28	23.9365	25.0155	160.1354	166.3386
42	22.9762	24.4947	153.7110	163.1928
50	22.4449	24.2091	150.1564	161.3902
100	19.3914	22.5450	129.7285	150.5419

Table B.8.5-11:FOCUS Step 1 PECsw and PECsed for RH-24549 after application to potatoes

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	50.7797	---	90.8331	---
1	50.5202	50.6500	92.4520	91.6425
2	50.4852	50.5763	92.3880	92.0313
4	50.4153	50.5133	92.2600	92.1776
7	50.3106	50.4488	92.0683	92.1718
14	50.0670	50.3188	91.6227	92.0086
21	49.8247	50.1944	91.1792	91.8060
28	49.5835	50.0718	90.7379	91.5941
42	49.1047	49.8291	89.8616	91.1624
50	48.8332	49.6915	89.3647	90.9145
100	47.1697	48.8441	86.3206	89.3742

Table B.8.5-12:FOCUS Step 1 PECsw and PECsed for RH-24549 after application to vines (early application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	50.7548	---	90.8331	---
1	50.5002	50.6275	92.4155	91.6243
2	50.4653	50.5551	92.3514	92.0038
4	50.3953	50.4927	92.2235	92.1456
7	50.2907	50.4285	92.0319	92.1379
14	50.0472	50.2987	91.5864	91.9735
21	49.8050	50.1745	91.1431	91.7705
28	49.5639	50.0519	90.7020	91.5585
42	49.0853	49.8094	89.8261	91.1268
50	48.8138	49.6718	89.3293	90.8789
100	47.1511	48.8247	86.2865	89.3390

Table B.8.5-13:FOCUS Step 1 PECsw and PECsed for RH-24549 after application to vines (late application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	52.9647	---	90.8331	---
1	52.2754	52.6201	95.6641	93.2486
2	52.2392	52.4387	95.5978	94.4397
4	52.1669	52.3209	95.4653	94.9856
7	52.0585	52.2316	95.2670	95.1487
14	51.8065	52.0820	94.8059	95.0925
21	51.5558	51.9484	94.3470	94.9204
28	51.3062	51.8190	93.8904	94.7199
42	50.8107	51.5653	92.9836	94.2921
50	50.5298	51.4221	92.4695	94.0415
100	48.8085	50.5431	89.3196	92.4635

Table B.8.5-14:FOCUS Step 1 PECsw and PECsed for RH-163353 after application to potatoes

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	44.6193		27.6812	
1	44.2635	44.4414	30.0992	28.8902
2	44.2328	44.3448	30.0783	29.4895
4	44.1715	44.2735	30.0366	29.7735
7	44.0798	44.2101	29.9742	29.8729
14	43.8664	44.0916	29.8292	29.8873
21	43.6541	43.9811	29.6848	29.8438
28	43.4428	43.8729	29.5411	29.7861
42	43.0233	43.6595	29.2558	29.6568
50	42.7853	43.5387	29.0940	29.5797
100	41.3279	42.7955	28.1030	29.0877

Table B.8.5-15:FOCUS Step 1 PECsw and PECsed for RH-163353 after application to vines (early application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	44.5343		27.6812	
1	44.1855	44.3599	30.0462	28.8637
2	44.1549	44.2651	30.0253	29.4497
4	44.0937	44.1947	29.9837	29.7271
7	44.0022	44.1318	29.9215	29.8238
14	43.7892	44.0137	29.7766	29.8364
21	43.5772	43.9035	29.6325	29.7924
28	43.3663	43.7955	29.4891	29.7345
42	42.9475	43.5825	29.2043	29.6052
50	42.7100	43.4619	29.0428	29.5281
100	41.2551	42.7201	28.0535	29.0367

Table B.8.5-16:FOCUS Step 1 PECsw and PECsed for RH-163353 after application to vines (late application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	52.0897		27.6812	
1	51.1081	51.5989	34.7535	31.2173
2	51.0727	51.3446	34.7294	32.9794
4	51.0019	51.1909	34.6813	33.8424
7	50.8960	51.0872	34.6093	34.1865
14	50.6496	50.9299	34.4417	34.3559
21	50.4044	50.7956	34.2750	34.3567
28	50.1605	50.6673	34.1091	34.3156
42	49.6761	50.4175	33.7797	34.1918
50	49.4014	50.2769	33.5929	34.1109
100	47.7186	49.4160	32.4486	33.5642

Table B.8.5-17:FOCUS Step 1 PECsw and PECsed for RH-141455 after application to potatoes

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	17.2991	---	0.4674	---
1	17.2849	17.2920	0.4840	0.4757
2	17.2729	17.2855	0.4836	0.4797
4	17.2490	17.2732	0.4830	0.4815
7	17.2132	17.2551	0.4820	0.4819
14	17.1298	17.2133	0.4796	0.4814
21	17.0469	17.1717	0.4773	0.4804
28	16.9644	17.1301	0.4750	0.4793
42	16.8006	17.0476	0.4704	0.4771
50	16.7077	17.0006	0.4678	0.4758
100	16.1386	16.7110	0.4519	0.4678

Table B.8.5-18:FOCUS Step 1 PECsw and PECsed for RH-141455 after application to vines (early application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	17.2859	---	0.4674	---
1	17.2718	17.2788	0.4836	0.4755
2	17.2598	17.2723	0.4833	0.4795
4	17.2359	17.2601	0.4826	0.4812
7	17.2001	17.2420	0.4816	0.4816
14	17.1168	17.2002	0.4793	0.4810
21	17.0340	17.1586	0.4770	0.4800
28	16.9515	17.1171	0.4746	0.4790
42	16.7878	17.0346	0.4701	0.4768
50	16.6950	16.9877	0.4675	0.4755
100	16.1263	16.6983	0.4515	0.4675

Table B.8.5-19:FOCUS Step 1 PECsw and PECsed for RH-141455 after application to vines (late application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	18.4578	---	0.4674	---
1	18.4385	18.4481	0.5163	0.4918
2	18.4257	18.4401	0.5159	0.5040
4	18.4002	18.4265	0.5152	0.5098
7	18.3619	18.4070	0.5141	0.5119
14	18.2731	18.3622	0.5116	0.5124
21	18.1846	18.3178	0.5092	0.5117
28	18.0966	18.2735	0.5067	0.5108
42	17.9218	18.1853	0.5018	0.5086
50	17.8227	18.1352	0.4990	0.5073
100	17.2156	17.8263	0.4820	0.4989

Table B.8.5-20:FOCUS Step 1 PECsw and PECsed for RH-141288 after application to potatoes

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.7289		0.0000	
1	1.7050	1.7169	0.1705	0.0852
2	1.7038	1.7107	0.1704	0.1278
4	1.7014	1.7066	0.1701	0.1491
7	1.6979	1.7037	0.1698	0.1580
14	1.6897	1.6987	0.1690	0.1637
21	1.6815	1.6943	0.1682	0.1653
28	1.6734	1.6901	0.1673	0.1659
42	1.6572	1.6818	0.1657	0.1661
50	1.6480	1.6772	0.1648	0.1660
100	1.5919	1.6485	0.1592	0.1640

Table B.8.5-21:FOCUS Step 1 PECsw and PECsed for RH-141288 after application to vines (early application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.6913		0.0000	
1	1.6679	1.6796	0.1668	0.0834
2	1.6667	1.6735	0.1667	0.1251
4	1.6644	1.6695	0.1664	0.1458
7	1.6610	1.6666	0.1661	0.1546
14	1.6529	1.6618	0.1653	0.1601
21	1.6449	1.6575	0.1645	0.1617
28	1.6370	1.6534	0.1637	0.1623
42	1.6212	1.6453	0.1621	0.1625
50	1.6122	1.6407	0.1612	0.1624
100	1.5573	1.6126	0.1557	0.1604

Table B.8.5-22:FOCUS Step 1 PECsw and PECsed for RH-141288 after application to vines (late application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	5.0307		0.0000	
1	4.9611	4.9959	0.4961	0.2481
2	4.9576	4.9776	0.4958	0.3720
4	4.9508	4.9659	0.4951	0.4337
7	4.9405	4.9572	0.4940	0.4598
14	4.9166	4.9429	0.4917	0.4763
21	4.8928	4.9301	0.4893	0.4810
28	4.8691	4.9178	0.4869	0.4828
42	4.8221	4.8937	0.4822	0.4834
50	4.7954	4.8801	0.4795	0.4830
100	4.6321	4.7967	0.4632	0.4772

Table B.8.5-23:FOCUS Step 1 PECsw and PECsed for RH-139432 after application to potatoes

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	10.9204		0.8793	
1	10.8849	10.9026	1.0885	0.9839
2	10.8773	10.8919	1.0877	1.0360
4	10.8622	10.8808	1.0862	1.0615
7	10.8397	10.8680	1.0840	1.0716
14	10.7872	10.8407	1.0787	1.0765
21	10.7350	10.8142	1.0735	1.0764
28	10.6830	10.7879	1.0683	1.0750
42	10.5799	10.7357	1.0580	1.0710
50	10.5214	10.7061	1.0521	1.0685
100	10.1630	10.5236	1.0163	1.0513

Table B.8.5-24:FOCUS Step 1 PECsw and PECsed for RH-139432 after application to vines (early application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	10.8741		0.8793	
1	10.8392	10.8567	1.0839	0.9816
2	10.8317	10.8461	1.0832	1.0326
4	10.8167	10.8352	1.0817	1.0575
7	10.7942	10.8224	1.0794	1.0674
14	10.7420	10.7953	1.0742	1.0721
21	10.6900	10.7688	1.0690	1.0719
28	10.6383	10.7427	1.0638	1.0705
42	10.5355	10.6907	1.0536	1.0666
50	10.4773	10.6612	1.0477	1.0640
100	10.1204	10.4795	1.0120	1.0469

Table B.8.5-25:FOCUS Step 1 PECsw and PECsed for RH-139432 after application to vines (late application)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	14.9829		0.8793	
1	14.8911	14.9370	1.4891	1.1842
2	14.8808	14.9115	1.4881	1.3364
4	14.8602	14.8910	1.4860	1.4117
7	14.8293	14.8712	1.4829	1.4429
14	14.7576	14.8323	1.4758	1.4611
21	14.6861	14.7955	1.4686	1.4648
28	14.6150	14.7592	1.4615	1.4649
42	14.4739	14.6876	1.4474	1.4614
50	14.3939	14.6470	1.4394	1.4585
100	13.9036	14.3972	1.3904	1.4366

Table B.8.5-26:FOCUS Step 2 PECsw and PECsed for zoxamide after application to potatoes (NEU)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	3.0869	---	35.4479	---
1	2.6639	2.8754	32.6056	34.0267
2	2.3904	2.7013	29.2588	32.4795
4	1.9249	2.4263	23.5605	29.4060
7	1.3909	2.0915	17.0246	25.4329
14	0.6517	1.5337	7.9767	18.6895
21	0.3053	1.1749	3.7374	14.3254
28	0.1431	0.9348	1.7511	11.3997
42	0.0314	0.6477	0.3844	7.9006
50	0.0132	0.5475	0.1616	6.6777
100	0.0001	0.2749	0.0007	3.3537

Table B.8.5-27: FOCUS Step 2 PECsw and PECsed for zoxamide after application to potatoes (SEU)

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	4.3454	---	50.8520	---
1	3.7932	4.0693	46.4285	48.6403
2	3.4038	3.8339	41.6629	46.3430
4	2.7409	3.4486	33.5488	41.9195
7	1.9806	2.9746	24.2421	36.2420
14	0.9280	2.1822	11.3584	26.6263
21	0.4348	1.6718	5.3219	20.4076
28	0.2037	1.3301	2.4935	16.2393
42	0.0447	0.9218	0.5474	11.2544
50	0.0188	0.7791	0.2302	9.5124
100	0.0001	0.3913	0.0010	4.7774

Table B.8.5-28:FOCUS Step 2 PECsw and PECsed for zoxamide after application to vines (early application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	3.7821	---	43.1716	---
1	3.2520	3.5171	39.8046	41.4881
2	2.9182	3.3011	35.7188	39.6249
4	2.3499	2.9637	28.7624	35.8857
7	1.6980	2.5542	20.7834	31.0409
14	0.7956	1.8729	9.7379	22.8123
21	0.3728	1.4347	4.5626	17.4859
28	0.1747	1.1414	2.1378	13.9148
42	0.0383	0.7909	0.4693	9.6437
50	0.0161	0.6685	0.1973	8.1510
100	0.0001	0.3357	0.0009	4.0936

Table B.8.5-29:FOCUS Step 2 PECsw and PECsed for zoxamide after application to vines (early application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	6.8026	---	80.1415	---
1	5.9624	6.3825	72.9797	76.5606
2	5.3504	6.0194	65.4886	72.8974
4	4.3084	5.4174	52.7344	65.9182
7	3.1132	4.6737	38.1054	56.9826
14	1.4587	3.4291	17.8540	41.8605
21	0.6834	2.6272	8.3653	32.0830
28	0.3202	2.0903	3.9195	25.5298
42	0.0703	1.4485	0.8605	17.6930
50	0.0296	1.2243	0.3618	14.9543
100	0.0001	0.6149	0.0016	7.5104

Table B.8.5-30: FOCUS Step 2 PECsw and PECsed for zoxamide after application to vines (late application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	5.3218	---	35.6471	---
1	3.2986	4.3102	34.9334	35.2902
2	2.6861	3.6512	31.3476	34.2154
4	3.6181	3.2035	25.2425	31.2139
7	2.2982	3.0268	18.2400	27.0821
14	1.0768	2.3197	8.5462	19.9405
21	0.5045	1.7983	4.0043	15.2926
28	0.2364	1.4373	1.8762	12.1719
42	0.0519	0.9988	0.4119	8.4368
50	0.0218	0.8445	0.1732	7.1311
100	0.0001	0.4243	0.0008	3.5815

Table B.8.5-31: FOCUS Step 2 PECsw and PECsed for zoxamide after application to vines (late application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	5.3218	---	44.8896	---
1	3.2986	4.3102	43.2271	44.0583
2	2.6861	3.6512	38.7901	42.5335
4	4.3732	3.2979	31.2355	38.7220
7	2.8438	3.3573	22.5705	33.5675
14	1.3325	2.6764	10.5752	24.7026
21	0.6243	2.0959	4.9549	18.9419
28	0.2925	1.6815	2.3216	15.0757
42	0.0642	1.1712	0.5097	10.4492
50	0.0270	0.9907	0.2143	8.8319
100	0.0001	0.4978	0.0010	4.4357

Table B.8.5-32: FOCUS Step 2 PECsw and PECsed for RH-127450 after application to potatoes - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.4343	---	8.3890	---
1	1.2540	1.3441	8.3645	8.3768
2	1.2503	1.2981	8.3401	8.3646
4	1.2430	1.2724	8.2915	8.3402
7	1.2322	1.2575	8.2190	8.3038
14	1.2072	1.2385	8.0525	8.2196
21	1.1827	1.2240	7.8893	8.1366
28	1.1588	1.2107	7.7294	8.0547
42	1.1123	1.1856	7.4193	7.8943
50	1.0865	1.1718	7.2478	7.8045
100	0.9387	1.0913	6.2617	7.2736

Table B.8.5-33:FOCUS Step 2 PECsw and PECsed for RH-127450 after application to potatoes - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.5897	---	9.4255	---
1	1.4089	1.4993	9.3980	9.4117
2	1.4048	1.4531	9.3705	9.3980
4	1.3966	1.4269	9.3159	9.3706
7	1.3844	1.4113	9.2345	9.3297
14	1.3563	1.3908	9.0474	9.2352
21	1.3288	1.3747	8.8640	9.1419
28	1.3019	1.3599	8.6844	9.0499
42	1.2497	1.3318	8.3360	8.8696
50	1.2208	1.3163	8.1432	8.7687
100	1.0547	1.2260	7.0354	8.1723

Table B.8.5-34:FOCUS Step 2 PECsw and PECsed for RH-127450 after application to vines (early application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.8747	---	10.9301	---
1	1.6338	1.7542	10.8982	10.9142
2	1.6290	1.6928	10.8664	10.8982
4	1.6195	1.6586	10.8030	10.8664
7	1.6054	1.6388	10.7086	10.8190
14	1.5728	1.6139	10.4916	10.7094
21	1.5410	1.5949	10.2790	10.6012
28	1.5097	1.5775	10.0707	10.4946
42	1.4492	1.5448	9.6667	10.2855
50	1.4157	1.5268	9.4431	10.1685
100	1.2231	1.4219	8.1585	9.4768

Table B.8.5-35:FOCUS Step 2 PECsw and PECsed for RH-127450 after application to vines (early application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	2.2476	---	13.4176	---
1	2.0056	2.1266	13.3784	13.3980
2	1.9998	2.0647	13.3394	13.3785
4	1.9881	2.0293	13.2616	13.3395
7	1.9707	2.0079	13.1457	13.2812
14	1.9308	1.9793	12.8793	13.1467
21	1.8917	1.9566	12.6183	13.0139
28	1.8533	1.9356	12.3626	12.8829
42	1.7790	1.8957	11.8667	12.6263
50	1.7378	1.8737	11.5922	12.4827
100	1.5014	1.7452	10.0152	11.6336

Table B.8.5-36:FOCUS Step 2 PECsw and PECsed for RH-127450 after application to vines (late application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	4.7282	---	24.6070	---
1	4.2742	4.5012	24.5351	24.5711
2	4.1928	4.3674	24.4635	24.5352
4	4.3423	4.2930	24.3208	24.4637
7	3.6567	4.0739	24.1084	24.3569
14	3.5826	3.8467	23.6198	24.1101
21	3.5100	3.7465	23.1412	23.8666
28	3.4389	3.6785	22.6722	23.6264
42	3.3009	3.5755	21.7627	23.1557
50	3.2246	3.5254	21.2594	22.8924
100	2.7859	3.2627	18.3672	21.3352

Table B.8.5-37:FOCUS Step 2 PECsw and PECsed for RH-127450 after application to vines (late application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	4.7282	---	25.2289	---
1	4.2742	4.5012	25.1552	25.1921
2	4.1928	4.3674	25.0817	25.1553
4	4.4356	4.3047	24.9355	25.0819
7	3.7491	4.1203	24.7176	24.9724
14	3.6732	3.9157	24.2167	24.7194
21	3.5987	3.8224	23.7260	24.4698
28	3.5258	3.7573	23.2452	24.2235
42	3.3844	3.6564	22.3126	23.7409
50	3.3061	3.6066	21.7966	23.4710
100	2.8563	3.3412	18.8313	21.8744

Table B.8.5-38:FOCUS Step 2 PECsw and PECsed for RH-24549 after application to potatoes - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.9111	---	3.4194	---
1	1.8685	1.8898	3.4170	3.4182
2	1.8672	1.8788	3.4147	3.4170
4	1.8647	1.8724	3.4099	3.4147
7	1.8608	1.8682	3.4029	3.4111
14	1.8518	1.8623	3.3864	3.4029
21	1.8428	1.8573	3.3700	3.3946
28	1.8339	1.8525	3.3537	3.3864
42	1.8162	1.8434	3.3213	3.3701
50	1.8061	1.8382	3.3029	3.3608
100	1.7446	1.8067	3.1904	3.3036

Table B.8.5-39:FOCUS Step 2 PECsw and PECsed for RH-24549 after application to potatoes - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	2.5511	---	4.5898	---
1	2.5081	2.5296	4.5866	4.5882
2	2.5064	2.5184	4.5835	4.5866
4	2.5029	2.5115	4.5771	4.5835
7	2.4977	2.5067	4.5676	4.5787
14	2.4856	2.4992	4.5455	4.5676
21	2.4736	2.4926	4.5235	4.5566
28	2.4616	2.4864	4.5016	4.5456
42	2.4378	2.4741	4.4581	4.5236
50	2.4243	2.4673	4.4335	4.5112
100	2.3418	2.4250	4.2824	4.4344

Table B.8.5-40:FOCUS Step 2 PECsw and PECsed for RH-24549 after application to vines (early application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	2.3796	---	4.2507	---
1	2.3228	2.3512	4.2478	4.2492
2	2.3212	2.3366	4.2448	4.2478
4	2.3180	2.3281	4.2390	4.2448
7	2.3132	2.3227	4.2301	4.2404
14	2.3020	2.3151	4.2097	4.2302
21	2.2908	2.3089	4.1893	4.2199
28	2.2797	2.3030	4.1690	4.2097
42	2.2577	2.2916	4.1288	4.1894
50	2.2452	2.2851	4.1059	4.1779
100	2.1687	2.2460	3.9661	4.1067

Table B.8.5-41:FOCUS Step 2 PECsw and PECsed for RH-24549 after application to vines (early application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	3.9156	---	7.0597	---
1	3.8577	3.8867	7.0548	7.0572
2	3.8551	3.8715	7.0499	7.0548
4	3.8497	3.8620	7.0401	7.0499
7	3.8417	3.8550	7.0255	7.0426
14	3.8231	3.8437	6.9915	7.0255
21	3.8046	3.8338	6.9577	7.0085
28	3.7862	3.8242	6.9240	6.9916
42	3.7497	3.8054	6.8571	6.9579
50	3.7289	3.7948	6.8192	6.9387
100	3.6019	3.7299	6.5869	6.8206

Table B.8.5-42:FOCUS Step 2 PECsw and PECsed for RH-24549 after application to vines (late application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	3.1024	---	5.3943	---
1	2.9477	3.0250	5.3905	5.3924
2	2.9457	2.9858	5.3868	5.3905
4	2.9416	2.9647	5.3793	5.3868
7	2.9355	2.9535	5.3682	5.3812
14	2.9213	2.9409	5.3422	5.3682
21	2.9071	2.9320	5.3163	5.3552
28	2.8930	2.9240	5.2906	5.3423
42	2.8651	2.9090	5.2395	5.3165
50	2.8493	2.9007	5.2105	5.3019
100	2.7522	2.8506	5.0330	5.2116

Table B.8.5-43:FOCUS Step 2 PECsw and PECsed for RH-24549 after application to vines (late application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	3.4864	---	6.0965	---
1	3.3314	3.4089	6.0923	6.0944
2	3.3291	3.3696	6.0881	6.0923
4	3.3245	3.3482	6.0796	6.0881
7	3.3176	3.3366	6.0670	6.0818
14	3.3015	3.3231	6.0376	6.0670
21	3.2856	3.3132	6.0084	6.0524
28	3.2697	3.3043	5.9793	6.0377
42	3.2381	3.2875	5.9216	6.0086
50	3.2202	3.2782	5.8888	5.9921
100	3.1105	3.2216	5.6883	5.8900

Table B.8.5-44:FOCUS Step 2 PECsw and PECsed for RH-163353 after application to potatoes - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	3.7585	---	2.5095	---
1	3.6904	3.7245	2.5077	2.5086
2	3.6878	3.7068	2.5060	2.5077
4	3.6827	3.6960	2.5025	2.5060
7	3.6751	3.6887	2.4973	2.5034
14	3.6573	3.6774	2.4852	2.4973
21	3.6396	3.6678	2.4732	2.4913
28	3.6220	3.6585	2.4612	2.4853
42	3.5870	3.6405	2.4375	2.4733
50	3.5672	3.6304	2.4240	2.4665
100	3.4457	3.5682	2.3414	2.4245

Table B.8.5-45:FOCUS Step 2 PECsw and PECsed for RH-163353 after application to potatoes - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	4.4550	---	2.9827	---
1	4.3864	4.4207	2.9807	2.9817
2	4.3833	4.4028	2.9786	2.9807
4	4.3773	4.3915	2.9745	2.9786
7	4.3682	4.3835	2.9683	2.9755
14	4.3470	4.3705	2.9539	2.9683
21	4.3260	4.3592	2.9396	2.9611
28	4.3050	4.3483	2.9254	2.9540
42	4.2635	4.3269	2.8972	2.9397
50	4.2399	4.3149	2.8811	2.9316
100	4.0955	4.2411	2.7830	2.8817

Table B.8.5-46:FOCUS Step 2 PECsw and PECsed for RH-163353 after application to vines (early application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	4.8335	---	3.2250	---
1	4.7426	4.7881	3.2228	3.2239
2	4.7393	4.7645	3.2205	3.2228
4	4.7328	4.7503	3.2161	3.2205
7	4.7229	4.7407	3.2094	3.2172
14	4.7001	4.7261	3.1938	3.2094
21	4.6773	4.7136	3.1784	3.2016
28	4.6547	4.7017	3.1630	3.1939
42	4.6097	4.6785	3.1325	3.1785
50	4.5842	4.6655	3.1151	3.1697
100	4.4281	4.5856	3.0090	3.1158

Table B.8.5-47:FOCUS Step 2 PECsw and PECsed for RH-163353 after application to vines (early application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	6.5050	---	4.3608	---
1	6.4130	6.4590	4.3578	4.3593
2	6.4085	6.4349	4.3548	4.3578
4	6.3996	6.4195	4.3487	4.3548
7	6.3864	6.4081	4.3397	4.3503
14	6.3554	6.3895	4.3187	4.3397
21	6.3247	6.3730	4.2978	4.3292
28	6.2941	6.3571	4.2770	4.3188
42	6.2333	6.3259	4.2357	4.2980
50	6.1988	6.3084	4.2123	4.2861
100	5.9877	6.2005	4.0688	4.2131

Table B.8.5-48:FOCUS Step 2 PECsw and PECsed for RH-163353 after application to vines (late application) - NEU

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	9.5861	---	6.3492	---
1	9.3371	9.4616	6.3448	6.3470
2	9.3306	9.3977	6.3404	6.3448
4	9.3177	9.3610	6.3317	6.3404
7	9.2984	9.3383	6.3185	6.3339
14	9.2534	9.3071	6.2879	6.3185
21	9.2086	9.2817	6.2575	6.3033
28	9.1640	9.2578	6.2272	6.2880
42	9.0755	9.2118	6.1671	6.2577
50	9.0253	9.1860	6.1330	6.2405
100	8.7179	9.0283	5.9241	6.1342

Table B.8.5-49:FOCUS Step 2 PECsw and PECsed for RH-163353 after application to vines (late application) - SEU

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	10.0039	---	6.6332	---
1	9.7547	9.8793	6.6286	6.6309
2	9.7479	9.8153	6.6240	6.6286
4	9.7344	9.7783	6.6148	6.6240
7	9.7142	9.7551	6.6011	6.6171
14	9.6672	9.7229	6.5691	6.6011
21	9.6204	9.6965	6.5373	6.5852
28	9.5738	9.6717	6.5057	6.5692
42	9.4814	9.6236	6.4429	6.5376
50	9.4290	9.5967	6.4072	6.5196
100	9.1078	9.4321	6.1890	6.4085

Table B.8.5-50:FOCUS Step 2 PECsw and PECsed for RH-141455 after application to potatoes - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.3738	---	0.0384	---
1	1.3723	1.3731	0.0384	0.0384
2	1.3714	1.3725	0.0384	0.0384
4	1.3695	1.3715	0.0383	0.0384
7	1.3666	1.3700	0.0382	0.0383
14	1.3600	1.3667	0.0381	0.0382
21	1.3534	1.3634	0.0379	0.0381
28	1.3469	1.3601	0.0377	0.0381
42	1.3339	1.3535	0.0373	0.0379
50	1.3265	1.3498	0.0371	0.0378
100	1.2813	1.3268	0.0359	0.0371

Table B.8.5-51:FOCUS Step 2 PECsw and PECsed for RH-141455 after application to potatoes - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.8666	---	0.0522	---
1	1.8648	1.8657	0.0522	0.0522
2	1.8635	1.8649	0.0521	0.0522
4	1.8610	1.8636	0.0521	0.0521
7	1.8571	1.8616	0.0520	0.0521
14	1.8481	1.8571	0.0517	0.0520
21	1.8392	1.8526	0.0515	0.0518
28	1.8303	1.8481	0.0512	0.0517
42	1.8126	1.8392	0.0507	0.0515
50	1.8026	1.8342	0.0504	0.0513
100	1.7412	1.8029	0.0487	0.0504

Table B.8.5-52:FOCUS Step 2 PECsw and PECsed for RH-141455 after application to vines (early application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.7016	---	0.0476	---
1	1.6998	1.7007	0.0476	0.0476
2	1.6986	1.6999	0.0475	0.0476
4	1.6962	1.6987	0.0475	0.0475
7	1.6927	1.6969	0.0474	0.0475
14	1.6845	1.6927	0.0471	0.0474
21	1.6764	1.6886	0.0469	0.0472
28	1.6682	1.6845	0.0467	0.0471
42	1.6521	1.6764	0.0462	0.0469
50	1.6430	1.6718	0.0460	0.0468
100	1.5870	1.6433	0.0444	0.0460

Table B.8.5-53:FOCUS Step 2 PECsw and PECsed for RH-141455 after application to vines (early application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	2.8844	---	0.0807	---
1	2.8817	2.8830	0.0806	0.0807
2	2.8797	2.8819	0.0806	0.0806
4	2.8757	2.8798	0.0805	0.0806
7	2.8698	2.8768	0.0803	0.0805
14	2.8559	2.8698	0.0799	0.0803
21	2.8420	2.8628	0.0795	0.0801
28	2.8283	2.8559	0.0791	0.0799
42	2.8010	2.8422	0.0784	0.0795
50	2.7855	2.8343	0.0779	0.0793
100	2.6906	2.7860	0.0753	0.0780

Table B.8.5-54:FOCUS Step 2 PECsw and PECsed for RH-141455 after application to vines (late application) - NEU

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	2.0271	---	0.0567	---
1	2.0239	2.0255	0.0566	0.0566
2	2.0225	2.0243	0.0566	0.0566
4	2.0197	2.0227	0.0565	0.0566
7	2.0155	2.0205	0.0564	0.0565
14	2.0057	2.0156	0.0561	0.0564
21	1.9960	2.0107	0.0558	0.0563
28	1.9864	2.0058	0.0556	0.0561
42	1.9672	1.9961	0.0550	0.0559
50	1.9563	1.9906	0.0547	0.0557
100	1.8897	1.9567	0.0529	0.0547

Table B.8.5-55:FOCUS Step 2 PECsw and PECsed for RH-141455 after application to vines (late application) - SEU

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	2.3228	---	0.0649	---
1	2.3194	2.3211	0.0649	0.0649
2	2.3178	2.3198	0.0649	0.0649
4	2.3146	2.3180	0.0648	0.0649
7	2.3097	2.3155	0.0646	0.0648
14	2.2986	2.3098	0.0643	0.0646
21	2.2874	2.3042	0.0640	0.0645
28	2.2764	2.2986	0.0637	0.0643
42	2.2544	2.2875	0.0631	0.0640
50	2.2419	2.2812	0.0627	0.0638
100	2.1656	2.2424	0.0606	0.0627

Table B.8.5-56:FOCUS Step 2 PECsw and PECsed for RH-141288 after application to potatoes - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.1040	---	0.1093	---
1	1.1013	1.1027	0.1093	0.1093
2	1.1005	1.1018	0.1092	0.1093
4	1.0990	1.1008	0.1090	0.1092
7	1.0919	1.0978	0.1088	0.1091
14	1.0866	1.0935	0.1083	0.1088
21	1.0814	1.0903	0.1078	0.1085
28	1.0761	1.0874	0.1072	0.1083
42	1.0657	1.0819	0.1062	0.1078
50	1.0598	1.0789	0.1056	0.1075
100	1.0237	1.0603	0.1020	0.1056

Table B.8.5-57:FOCUS Step 2 PECsw and PECsed for RH-141288 after application to potatoes - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.1040	---	0.1093	---
1	1.1013	1.1027	0.1093	0.1093
2	1.1005	1.1018	0.1092	0.1093
4	1.0990	1.1008	0.1090	0.1092
7	1.0919	1.0978	0.1088	0.1091
14	1.0866	1.0935	0.1083	0.1088
21	1.0814	1.0903	0.1078	0.1085
28	1.0761	1.0874	0.1072	0.1083
42	1.0657	1.0819	0.1062	0.1078
50	1.0598	1.0789	0.1056	0.1075
100	1.0237	1.0603	0.1020	0.1056

Table B.8.5-58:FOCUS Step 2 PECsw and PECsed for RH-141288 after application to vines (early application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.4757	---	0.1462	---
1	1.4721	1.4739	0.1461	0.1461
2	1.4710	1.4727	0.1460	0.1461
4	1.4690	1.4714	0.1457	0.1460
7	1.4595	1.4674	0.1454	0.1458
14	1.4524	1.4617	0.1447	0.1454
21	1.4454	1.4574	0.1440	0.1451
28	1.4384	1.4536	0.1433	0.1447
42	1.4245	1.4462	0.1420	0.1440
50	1.4167	1.4421	0.1412	0.1437
100	1.3684	1.4172	0.1364	0.1412

Table B.8.5-59:FOCUS Step 2 PECsw and PECsed for RH-141288 after application to vines (early application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	1.4757	---	0.1462	---
1	1.4721	1.4739	0.1461	0.1461
2	1.4710	1.4727	0.1460	0.1461
4	1.4690	1.4714	0.1457	0.1460
7	1.4595	1.4674	0.1454	0.1458
14	1.4524	1.4617	0.1447	0.1454
21	1.4454	1.4574	0.1440	0.1451
28	1.4384	1.4536	0.1433	0.1447
42	1.4245	1.4462	0.1420	0.1440
50	1.4167	1.4421	0.1412	0.1437
100	1.3684	1.4172	0.1364	0.1412

Table B.8.5-60:FOCUS Step 2 PECsw and PECsed for RH-141288 after application to vines (late application) - NEU

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	4.0838	---	0.4045	---
1	4.0737	4.0787	0.4042	0.4043
2	4.0708	4.0755	0.4039	0.4042
4	4.0652	4.0717	0.4033	0.4039
7	4.0389	4.0607	0.4025	0.4035
14	4.0194	4.0449	0.4005	0.4025
21	3.9999	4.0332	0.3986	0.4015
28	3.9806	4.0224	0.3967	0.4006
42	3.9421	4.0021	0.3928	0.3986
50	3.9203	3.9907	0.3907	0.3975
100	3.7868	3.9219	0.3774	0.3908

Table B.8.5-61:FOCUS Step 2 PECsw and PECsed for RH-141288 after application to vines (late application) - SEU

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	4.0838	---	0.4045	---
1	4.0737	4.0787	0.4042	0.4043
2	4.0708	4.0755	0.4039	0.4042
4	4.0652	4.0717	0.4033	0.4039
7	4.0389	4.0607	0.4025	0.4035
14	4.0194	4.0449	0.4005	0.4025
21	3.9999	4.0332	0.3986	0.4015
28	3.9806	4.0224	0.3967	0.4006
42	3.9421	4.0021	0.3928	0.3986
50	3.9203	3.9907	0.3907	0.3975
100	3.7868	3.9219	0.3774	0.3908

Table B.8.5-62:FOCUS Step 2 PECsw and PECsed for RH-139432 after application to potatoes - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	2.2194	---	0.2212	---
1	2.2120	2.2157	0.2210	0.2211
2	2.2104	2.2134	0.2209	0.2210
4	2.2074	2.2112	0.2206	0.2209
7	2.2028	2.2086	0.2201	0.2207
14	2.1921	2.2030	0.2191	0.2201
21	2.1815	2.1976	0.2180	0.2196
28	2.1710	2.1923	0.2169	0.2191
42	2.1500	2.1817	0.2148	0.2180
50	2.1381	2.1756	0.2137	0.2174
100	2.0653	2.1386	0.2064	0.2137

Table B.8.5-63:FOCUS Step 2 PECsw and PECsed for RH-139432 after application to potatoes - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	2.6530	---	0.2645	---
1	2.6453	2.6492	0.2643	0.2644
2	2.6434	2.6468	0.2642	0.2643
4	2.6398	2.6442	0.2638	0.2642
7	2.6343	2.6411	0.2632	0.2639
14	2.6216	2.6345	0.2620	0.2632
21	2.6089	2.6281	0.2607	0.2626
28	2.5962	2.6217	0.2594	0.2620
42	2.5712	2.6090	0.2569	0.2607
50	2.5569	2.6018	0.2555	0.2600
100	2.4698	2.5575	0.2468	0.2556

Table B.8.5-64:FOCUS Step 2 PECsw and PECsed for RH-139432 after application to vines (early application) - NEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	2.8481	---	0.2838	---
1	2.8382	2.8432	0.2836	0.2837
2	2.8363	2.8402	0.2834	0.2836
4	2.8323	2.8373	0.2830	0.2834
7	2.8265	2.8339	0.2824	0.2831
14	2.8128	2.8267	0.2811	0.2825
21	2.7992	2.8198	0.2797	0.2818
28	2.7856	2.8130	0.2784	0.2811
42	2.7587	2.7994	0.2757	0.2797
50	2.7435	2.7916	0.2742	0.2790
100	2.6500	2.7440	0.2648	0.2742

Table B.8.5-65:FOCUS Step 2 PECsw and PECsed for RH-139432 after application to vines (early application) - SEU

Time (d)	PECsw (µg/L)		PECsed(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	3.8888	---	0.3878	---
1	3.8782	3.8835	0.3876	0.3877
2	3.8755	3.8802	0.3873	0.3876
4	3.8701	3.8765	0.3867	0.3873
7	3.8621	3.8720	0.3859	0.3869
14	3.8434	3.8624	0.3841	0.3859
21	3.8248	3.8530	0.3822	0.3850
28	3.8063	3.8436	0.3804	0.3841
42	3.7695	3.8250	0.3767	0.3822
50	3.7487	3.8145	0.3746	0.3812
100	3.6210	3.7495	0.3618	0.3747

Table B.8.5-66:FOCUS Step 2 PECsw and PECsed for RH-139432 after application to vines (late application) - NEU

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	5.5221	---	0.5496	---
1	5.4963	5.5092	0.5493	0.5494
2	5.4925	5.5018	0.5489	0.5493
4	5.4849	5.4953	0.5481	0.5489
7	5.4735	5.4884	0.5470	0.5483
14	5.4470	5.4743	0.5443	0.5470
21	5.4207	5.4608	0.5417	0.5457
28	5.3944	5.4475	0.5391	0.5443
42	5.3423	5.4211	0.5339	0.5417
50	5.3128	5.4062	0.5309	0.5402
100	5.1318	5.3140	0.5128	0.5310

Table B.8.5-67:FOCUS Step 2 PECsw and PECsed for RH-139432 after application to vines (late application) - SEU

Time (d)	PEC_{sw} (µg/L)		PEC_{sed}(µg/kg dry sediment)	
	Actual	TWA	Actual	TWA
0	5.7823	---	0.5756	---
1	5.7563	5.7693	0.5752	0.5754
2	5.7523	5.7618	0.5748	0.5752
4	5.7444	5.7551	0.5740	0.5748
7	5.7324	5.7479	0.5728	0.5742
14	5.7047	5.7333	0.5701	0.5728
21	5.6771	5.7191	0.5673	0.5715
28	5.6496	5.7052	0.5646	0.5701
42	5.5950	5.6775	0.5591	0.5673
50	5.5641	5.6619	0.5560	0.5658
100	5.3746	5.5653	0.5371	0.5561

FOCUS Step 3 and 4 modelling was performed for the active substance. The details of this modelling are summarised below.

RMS comment:

FOCUS Step 1 and 2 calculations for zoxamide and its metabolites RH-12750, RH-163353 and RH-141288 are considered acceptable. However, it is unclear why no occurence (0%) in water/sediment system was considered for metabolites RH-24549 and RH-11455, according to *Van den Bosch M.M.H. (2014)* maximum occurence of RH-24549 and RH-11455 in surface water is 22.7% and 10.5%, respectively. Moreover, it was noted that incorrect molecular weight has been used for metabolite RH-141455 – 265.09 g/mol instead of 235.02 g/mol. Given the above, RMS re-calculated Step 1 and 2 for both metabolites – RH-24549 and RH-11455.

In addition, RMS did Step 1 and 2 calculations also for metabolite RH-139432. Both in aqueous photolysis study as well as in aerobic mineralisation in surface water study RH-139432 was formed at >10% (42.4% AR and 21.4%, respectively), hence RMS believes that a risk assessment should be carried out for the particular metabolite.

The predicted concentrations are appropriate for the subsequent risk assessment for water and sediment organisms.

Reference:	Callow B., Montesano V. (2014). Predicted environmental concentrations of zoxamide in surface water in the EU using the FOCUS surface water scenarios.
Guideline(s):	FOCUS (2001, 2012)
GLP:	No (calculation - GLP is not relevant)
Previous evaluation:	Submitted for the purpose of renewal
Validity of the study:	Considered acceptable

For simulation details (input parameters, calculation methods and results) please see the study below (Callow & Montesano 2015b).

Reference:	Callow B., Montesano V. (2015b). Predicted environmental concentrations of zoxamide in surface water in the EU using the FOCUS surface water scenarios – Additional simulations.
Guideline(s):	FOCUS (2001, 2012)
GLP:	No (calculation - GLP is not relevant)
Previous evaluation:	Submitted for the purpose of renewal
Validity of the study:	Considered acceptable

Executive Summary

Surface water modelling of zoxamide was carried out based on application to vines at BBCH 15-79, and to potatoes at BBCH 20-80 with an application rate of 5 x 180 g a.s./ha (8 days interval). Respective single applications were also considered. Step 3 modelling was undertaken with all appropriate FOCUS scenarios for these two crops. A DT_{50} in soil of 6.4 days, a K_{oc} of 1224 ml/g were assumed. In the original modelling (Callow & Montesano 2014), the results of which are also included, a $DT_{50water}$ = 6.4 days and DT_{50sed} = 1000 days were used and the combination of $DT_{50water}$ = 1000 days and DT_{50sed} = 6.4 days was not considered as required by the guidance. Additional modelling (Callow & Montesano 2015b) was therefore performed using a DT_{50} in water of 1000 days and a DT_{50} in sediment of 6.4 days. At FOCUS Step 3, the maximum PEC_{sw} in surface water were 0.035 to ~~4.28~~ 3.54 µg/L. Step 4 simulations were run for both crops with 10 and 20 m buffer zones. For single applications to potatoes a 10 m buffer, in some instances including a 10m vegetative strip were required to achieve concentrations below 0.35 µg/L. For multiple application to potatoes and applications to vines (single and multiple, early and late) 10 m or 20 m buffers, in some instances with the associated vegetative strips were necessary to achieve concentrations below 0.35 µg/L. However, if simulations with VFSmod module are waived PEC_{sw} for R1 (potatoes, multiple) and R4 (vines early and late, multiple) scenarios will result in concentrations above 0.35 µg/L. Where exposure was due to drainage (D6 ditch, 2nd application to potatoes) mitigation was not possible as this is not incorporated within the FOCUS models.

I. MATERIAL AND METHODS

FOCUS surface water modelling was used to examine the potential of zoxamide to reach surface water following application to potatoes and vines using the FOCUS surface water models (Step 3 and 4). For FOCUS Step 3, FOCUS (2001) have developed crop, climate and soil data for ten representative locations within the EU. These aim to provide a realistic worst case for surface water exposure within the EU. The scenarios were developed to include spray drift exposure and drainage or run-off exposure to surface water as well as the fate of the compound within the water. Spray drift input is based on experimental data (Rautmann *et al*, 2001) whilst run-off input is simulated with PRZM v3.1.1 and drainage input simulated with MACRO v5.5.3. To manage these input data, an electronic interfacing program (SWASH v3.1) was developed which ensures that all relevant inputs are formulated for TOXSWA v3.3.1, the surface water fate model.

Step 4 allows for mitigation approaches to reduce surface water exposure and details and approaches for these are defined by the FOCUS Landscape and Mitigation Group (FOCUS 2005). In the current work, mitigation of the spray drift and run-off input was considered using the SWAN 3.0.0 software.

The vapour pressure of zoxamide is $<1.3 \times 10^{-5}$ Pa at 20 ^{o}C, hence it is marginally above the trigger set in the FOCUS air guidance document (FOCUS, 2008). Therefore deposition to surface water via this route needs to be considered and modelling of this process at Step 4 is necessary.

The input used for the simulations are summarised in Table B.8.5-68.

Table B.8.5-68:Input parameters for zoxamide

End-Point	Zoxamide
Molecular Weight (g/mol)	336.65
Vapour Pressure (Pa, 20°C)	$< 1.3 \times 10^{-5}$
Water Solubility, 20°C (mg/L)	0.681
K_{oc} / K_{om} (L/kg) – arith. mean	1224/710
1/n – arith. mean	0.973
DT_{50} in Soil (days) at 20^{o}C – geom. mean	6.4
DT_{50} in water(days) at 20^{o}C	1000 (default)/6.4*
DT_{50} in sediment (days) at 20^{o}C	6.4/1000 (default)*
Plant Uptake Factor**	0
Exponent for the effect of water content***	0.49 (MACRO) 0.7 (PRZM)

* Modelling in Callow & Montesano (2014) used a DT_{50} in water of 6.4 days and a DT_{50} in sediment of 1000 days.

** Conservative value.

*** FOCUS recommendation.

The effect of temperature on the rate of degradation was simulated by using a Q10 of 2.58 in line with FOCUS (2012).

The agronomic parameters used as input for the simulations were as follows:

Crop:	Potato
FOCUS Crop:	Potato
Application Rate:	1 x 180 g a.s./ha
	5 x 180 g a.s./ha (8 days interval)

Application timing:	37 days before harvest to 7 days before harvest for single application and 69 days before harvest to 7 days before harvest for multiple application (Actual dates set by PAT)
Crop Interception:	Calculated internally by MACRO or PRZM (foliar application defined in SWASH)
Appropriate Scenarios:	D3, D4, D6, R1, R2 and R3

Crop:	Vines
FOCUS Crop:	Vines (early application)
Application Rate:	1 x 180 g a.s./ha 5 x 180 g a.s./ha (8 days interval)
Application timing:	28 days after emergence to 58 days after emergence for single application and 28 days after emergence to 90 days after emergence for multiple application (Actual dates set by PAT)
Crop Interception:	Calculated internally by MACRO or PRZM (foliar application defined in SWASH)
Appropriate Scenarios:	D6, R1, R2, R3 and R4

Crop:	Vines
FOCUS Crop:	Vines (late application)
Application Rate:	1 x 180 g a.s./ha 5 x 180 g a.s./ha (8 days interval)
Application timing:	58 days before harvest to 28 days before harvest for single application and 90 days before harvest to 28 days before harvest for multiple application (Actual dates set by PAT)
Crop Interception:	Calculated internally by MACRO or PRZM (foliar application defined in SWASH)
Appropriate Scenarios:	D6, R1, R2, R3 and R4

At Step 4, 10 and 20 m buffer zones for spray drift were specified for potatoes and vines with SWAN 3.0.0 and this internally selected appropriate drift values from the FOCUS drift calculator.

Spray drift reduction, buffer zones of 10 m and 20 m, together with run-off reduction consistent with a vegetative buffer of 10 m (by reducing mass of eroded sediment by 85% and mass of pesticide in the water phase by 60%) and 20 m (by reducing mass of eroded sediment by 95% and mass of pesticide in the water phase by 80%) were considered when necessary. A further refinement to the run-off simulations for zoxamide was conducted by utilising the VFSmod module in the SWAN v3.0.0 tool. The VFSmod module calculates fractional reductions for run-off water volume & mass of active substance in the aqueous phase (run-off flux); and for the mass of eroded sediment and mass of active substance transported in the sediment phase (erosion flux), for individual run-off events for each scenario in which run-off is mitigated. These fractional reductions are then implemented in the Step 4 PRZM runs. When this was done for the scenarios where the main route of entry was run-off, the PECs obtained were lower than the ones obtained by the corresponding vegetative strip mitigation using the manual mode.

According to the FOCUS AIR report (2008) an additional input to surface water from dry deposition must be considered when spray drift mitigation of surface water exposure is required. The size of this input is determined using the EVA 2.1 model. Zoxamide has a vapour pressure of $<1.3 \times 10^{-5}$ Pa at 20°C which is marginally above the threshold of 1×10^{-5} Pa for substances applied to plants. EVA uses vapour pressure classes to determine the percentage volatilising/depositing over 24hrs. This also takes into account percentage crop cover anticipated since volatilisation from bare soil is less than from plant surfaces.

Amount deposited reduces with distance from the treated area. For zoxamide the percentage considered to be deposited at 10 m from application to potatoes is 0.03% when 50% crop cover is assumed. This was considered to be evenly deposited over 24hr leading to 0.0002 mg m^{-2} h^{-1} being input into SWAN for use on potatoes. For 20 m, the percentage considered to be deposited is 0.02% leading to 0.0001 mg m^{-2} h^{-1} being input into SWAN.

For vines (early application), the percentage considered to be deposited at 10 m is 0.05% when 50% crop cover is assumed. This was considered to be evenly deposited over 24hr leading to 0.00042 mg m^{-2} h^{-1} being input into SWAN. For 20 m, the percentage considered to be deposited is 0.03% leading to 0.00025 mg m^{-2} h^{-1}. For vines (late application), the percentage considered to be deposited at 10 m is 0.08% when 70% crop cover is assumed. This was considered to be evenly deposited over 24hr leading to 0.00058 mg m^{-2} h^{-1} being input into SWAN. For 20 m, the percentage considered to be deposited is 0.04% leading to 0.00033 mg m^{-2} h^{-1}.

All inputs from drainage, and all other parameters (e.g. timing of application) were the same in the Step 4 calculations as in the Step 3 calculations.

II. RESULTS AND DISCUSSION

FOCUS Step 3 simulations were performed for the use of zoxamide on potatoes and vines using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days and these were combined with the results of previous modelling (Callow & Montesano 2014) where a $DT_{50water}$ of 6.4 days and a DT_{50sed} of 1000 days were used. The initial PEC values at Step 3 are shown in Tables 8.5-69 to 8.5-74. Figures in bold in all the tables are those obtained for the simulations using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Results for potatoes show that for single applications the dominant route of exposure was drift. For multiple applications the dominant route of exposure was also drift for the D scenarios, with the exception of D6 ditch (2^{nd} crop) where drainage was the main exposure route. For the R scenarios, drift was the main route of exposure in the R1 stream scenario and run-off was the main route of exposure in the R2 and R3 stream scenarios.

For early and late application to vines, the dominant route of exposure in all scenarios was drift for single applications. For multiple applications, drift was the main exposure route with the exception of the R1 stream and R4 stream scenarios for early application and the R4 stream scenario for late application, where run-off was the dominant route of exposure.

The PEC_{sw} provided at Step 3 indicated that further mitigation was needed for various scenarios. Step 4 simulations were therefore undertaken.

For single applications to potatoes and vines (early application), a 10 m spray drift buffer zone was applied, but for those scenarios where run-off became the main route of exposure (R3 stream for potatoes and R1 and R3 stream for vines) a run-off reduction consistent with a vegetative buffer of 10 m (by reducing the mass of eroded sediment by 85% and mass of pesticide in the water phase by 60%) was also applied.

For single applications to vines (late application), a 20 m spray drift buffer zone was applied.

For multiple applications to potatoes and vines (early application), a 10 m spray drift buffer zone was applied to the D scenarios, except for the D6 ditch (2^{nd} crop) scenario for potatoes, where the exposure was due to drainage, so no further mitigation is possible within FOCUS. For multiple applications to vines (late application) a 20 m spray drift buffer zone was applied to the D scenarios. For the R scenarios of these crops the effect of spray drift reduction was assessed (buffer zones of 10 m and 20 m) together with run-off reduction consistent with a vegetative buffer of 10 m (by reducing the mass of eroded

sediment by 85% and mass of pesticide in the water phase by 60%) and 20 m (by reducing the mass of eroded sediment by 95% and mass of pesticide in the water phase by 80%). Additionally, the effect of the vegetative buffer strips was simulated using the VFS mode within SWAN 3.0.0. The PECs obtained using this mode were lower than those obtained for the corresponding vegetative strip mitigation using the manual mode. Initial FOCUS Step 4 PECsw and PECsed are shown in Tables 8.5-69 to 8.5-76 and 7 day TWA PECsw are summarised in Tables 8.5-77 to 8.5-79. Figures in bold in all the tables are those obtained for the simulations using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-69:Initial FOCUS Step 3 and 4 PECsw and PECsed for potatoes (single application)

Potatoes - Single application – 1 x 180 g/ha							
Scenario	PEC_{SW} [µg/L]			PEC_{SED} [µg/kg]			Main route of entry into water body at Step 3
	Step 3	Step 4		Step 3	Step 4		
		10 m *	10 m **		10 m *	10 m **	
D3 Ditch	0.943	0.164	-	0.487	0.093	-	Drift
D4 Pond	0.038	-	-	**0.086**#	-	-	Drift
D4 Stream	0.709	0.159	-	0.018	0.004	-	Drift
D6 Ditch (1st)	0.937	0.163	-	0.311	0.058	-	Drift
D6 Ditch (2nd)	~~**1.409**~~ **0.938**	~~**1.409**~~‡ **0.380**	-	~~0.285~~ **0.353**	~~0.069~~ **0.062**	-	~~Drainage~~ Drift
R1 Pond	0.038	-	-	**0.081**	-	-	Drift
R1 Stream	0.654	0.146	-	0.095	0.045	-	Drift
R2 Stream	0.877	0.312	-	0.385	0.379	-	Drift
R3 Stream	0.922	**0.618**†	0.282	0.967	0.918	0.244	Drift

* Mitigation: 10 m spray drift. ** Mitigation: 10 m spray drift and 10 m vegetative strip (manual).

† Run-off is the main route of entry when this mitigation is considered.

~~‡ No mitigation can be performed for drainage within the programme.~~

Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-70:Initial FOCUS Step 3 and 4 PECsw and PECsed for potatoes (multiple application)

Potatoes - Multiple application – 5 x 180 g/ha (8 days interval)											
Scenario	PEC_{SW} [µg/L]					PEC_{SED} [µg/kg]					Main route of entry into water body at Step 3
	Step 3	Step 4				Step 3	Step 4				
		10 m *	10 m **	20 m *	20 m **		10 m *	10 m **	20 m *	20 m **	
D3 Ditch	0.609	0.103	0.103	-	-	0.563	0.110	0.110	-	-	Drift
D4 Pond	0.047	-	-	-	-	**0.223**#	-	-	-	-	Drift
D4Stream	0.507	0.111	0.111	-	-	0.0335	**0.028**	**0.028**	-	-	Drift
D6 Ditch (1st)	0.605	0.102	0.102	-	-	0.321	0.061	0.061	-	-	Drift
D6 Ditch (2nd)	~~**4.281**~~ **1.370**	~~**4.281**~~‡ **1.370**‡	~~**4.281**~~‡ **1.370**‡	-	-	~~**0.863**~~ **0.367**	~~**0.745**~~ **0.280**	~~**0.745**~~ **0.280**	-	-	Drainage
R1 Pond	**0.534**	**0.235**	~~**0.103**~~	-	-	**1.248**	**0.558**	~~**0.264**~~	-	-	Run-off

R1Stream	**2.415**	**1.028**	~~0.368~~	**0.539**	~~0.0477~~	9.184	1.754	~~1.217~~	0.693	~~0.009~~	Run-off
R2Stream	**0.650**	0.289	~~0.122~~	-	-	2.847	0.540	~~0.016~~	-	-	Run-off
R3Stream	**0.961**	**0.439**	~~0.129~~	0.230	-	4.120	0.871	~~0.049~~	0.365	-	Run-off

* Spray drift and run-off mitigation was considered for the run-off scenarios (manual).

~~** Spray drift and run-off mitigation was considered for the run-off scenarios (VFS).~~

‡ No mitigation can be performed for drainage within the programme.

[#] Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-71: Initial FOCUS Step 3 and 4 PECsw and PECsed for vines (early application, single application)

Vines (early application) - Single application – 1 x 180 g/ha							
Scenario	**PEC_{SW} [µg/L]**			**PEC_{SED} [µg/kg]**			**Main route of entry into water body at Step 3**
	Step 3	**Step 4**		**Step 3**	**Step 4**		
		10 m *	**10 m ****		**10 m ***	**10 m ****	
D6 Ditch	1.015	0.213	-	0.518	0.124	-	Drift
R1 Pond	0.035	-	-	**0.090**[#]	-	-	Drift
R1 Stream	0.731	**0.460**†	**0.194**	0.183	0.172	0.069	Drift
R2 Stream	0.984	0.250	-	0.059	0.022	-	Drift
R3 Stream	1.043	0.265	-	0.177	0.046	-	Drift
R4 Stream	0.733	**0.674**†	0.305	0.646	0.638	0.273	Drift

* Mitigation: 10 m spray drift.

** Mitigation: 10 m spray drift and 10 m vegetative strip (manual).

† Run-off is the main route of entry when this mitigation is considered.

[#] Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-72: Initial FOCUS Step 3 and 4 PECsw and PECsed for vines (early application, multiple application)

Vines (early application) - Multiple application – 5 x 180 g/ha (8 days interval)											
Scenario	**PEC_{SW} [µg/L]**					**PEC_{SED} [µg/kg]**					**Main route of entry into water body at Step 3**
	Step 3	**Step 4**				**Step 3**	**Step 4**				
		10 m *	**10 m ****	**10 m *****	**20 m ****		**10 m ***	**10 m ****	**10 m *****	**20 m ****	
D6 Ditch	**1.471**[#]	**0.303**	-	-	-	2.137	0.495	-	-	-	Drift
R1 Pond	**0.126**	-	-	-	-	**0.302**	-	-	-	-	Drift
R1 Stream	**1.666**	-	**0.733**†	~~0.149~~	**0.379**	**0.990**	-	**0.386**	~~0.034~~	**0.194**	Run-off
R2 Stream	**0.854**	0.403†	0.199‡	~~0.199‡~~	-	0.638	0.611	0.179	~~0.025~~	-	Drift
R3 Stream	0.901	0.210	-	-	-	0.301	0.076	-	-	-	Drift
R4 Stream	**3.145**	-	**1.428**†	~~0.149~~	**0.748**	**2.900**	-	**1.199**	~~0.033~~	**0.617**	Run-off

* Mitigation: 10 m spray drift.

** Spray drift and run-off mitigation was considered (manual).

~~*** Spray drift and run-off mitigation was considered (VFS).~~

† Run-off is the main route of entry when this mitigation is considered.
‡ Spray drift is the main route of entry when this mitigation is considered.
[#] Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-73: Initial FOCUS Step 3 and 4 PECsw and PECsed for vines (late application, single application)

Vines (late application) - Single application – 1x 180 g/ha							
Scenario	PEC_{SW} [µg/L]			PEC_{SED} [µg/kg]			Main route of entry into water body at Step 3
	Step 3	Step 4		Step 3	Step 4		
		10 m *	20 m **		10 m *	20 m **	
D6 Ditch	3.086	0.676	0.237	**3.819**[#]	**0.890**	**0.326**	Drift
R1 Pond	0.110	-	-	**0.265**	-	-	Drift
R1 Stream	2.264	0.597	0.209	0.327	0.087	0.0305	Drift
R2 Stream	3.034	0.801	0.281	0.234	0.062	0.0217	Drift
R3 Stream	3.190	0.842	0.325	0.734	0.550	0.527	Drift
R4 Stream	2.263	0.597	0.209	0.323	0.086	0.0679	Drift

* Mitigation: 10 m spray drift.
** Mitigation: 20 m spray drift.
[#] Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-74: Initial FOCUS Step 3 PECsw and PECsed for vines (late application, multiple application)

Vines (late application) - Multiple application – 5 x 180 g/ha (8 days interval)			
Scenario	PEC_{SW} [µg/L]	PEC_{SED} [µg/kg]	Main route of entry into water body at Step 3
	Step 3	Step 3	
D6 Ditch	**3.546**[#]	8.442	Drift
R1 Pond	**0.308**	0.600	Drift
R1 Stream	1.857	0.421	Drift
R2 Stream	2.489	0.315	Drift
R3 Stream	2.622	1.823	Drift
R4 Stream	**2.128**	1.485	Run-off

[#] Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-75: Initial FOCUS 4 PECsw for vines (late application, multiple application)

Vines (late application) - Multiple application – 5 x 180 g/ha (8 days interval)						
Scenario	PEC_{SW} [µg/L]					
	Step 4					
	10 m (drift)	10 m *	10 m **	20 m (drift)	20 m *	20 m **
D6 Ditch	**0.776**[#]	-	-	**0.272**	-	-
R1 Pond	-	-	-	-	-	-
R1 Stream	0.482	-	-	0.167	-	-
R2 Stream	0.647	-	-	0.224	-	-
R3 Stream	**1.579**†	**0.707**†	~~0.680‡~~	**1.579**†	**0.368**†	~~0.235‡~~
R4 Stream	-	**0.950**†	~~0.482‡~~	-	**0.494**†	~~0.167‡~~

* Spray drift and run-off mitigation was considered (manual).
~~** Spray drift and run-off mitigation was considered (VFS).~~
† Run-off is the main route of entry when this mitigation is considered.

~~‡ Spray drift is the main route of entry when this mitigation is considered.~~

Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-76:Initial FOCUS Step 4 PECsed for vines (late application, multiple application)

Vines (late application) - Multiple application – 5 x 180 g/ha (8 days interval)						
Scenario	PEC_{SED} [µg/kg]					
	Step 4					
	10 m (drift)	10 m *	10 m **	20 m (drift)	20 m *	20 m **
D6 Ditch	2.005	-	-	0.738	-	-
R1 Pond	-	-	-	-	-	-
R1 Stream	0.114	-	-	0.063	-	-
R2 Stream	0.085	-	-	0.030	-	-
R3 Stream	1.504	0.711	~~0.259~~	1.423	0.348	~~0.112~~
R4 Stream	-	0.605	~~0.120~~	-	0.304	~~0.043~~

* Spray drift and run-off mitigation was considered (manual).

~~** Spray drift and run-off mitigation was considered (VFS).~~

Table B.8.5-77:7 day TWA PECsw for potatoes

Potatoes								
Scenario	Single application PEC_{SW} [µg/L]			Multiple applicationPEC_{SW} [µg/L]				
	Step 3	Step 4		Step 3	Step 4			
		10 m *	10 m **		10 m **	10 m ***	20 m **	20 m ***
D3 Ditch	**0.158**#	**0.030**	-	**0.102**	**0.020**	-	-	-
D4 Pond	**0.035**	-	-	**0.078**	-	-	-	-
D4 Stream	0.004	0.001	-	**0.011**	**0.011**	-	-	-
D6 Ditch (1st)	**0.083**	**0.016**	-	**0.063**	0.012	-	-	-
D6 Ditch (2nd)	**0.099**	**0.017**	-	0.126	0.082	-	-	-
R1 Pond	**0.035**	-	-	**0.503**	**0.223**	**~~0.100~~**	-	-
R1 Stream	0.020	0.013	-	**0.344**	**0.156**	~~0.036~~	0.081	~~0.002~~
R2 Stream	**0.042**	0.031	-	0.071	0.032	~~0.002~~	-	-
R3 Stream	**0.121**	0.083	**0.045**	**0.150**	0.062	~~0.008~~	**0.033**	-

* Mitigation: spray drift only.

** Spray drift and run-off mitigation was considered for the run-off scenarios (manual).

~~***Spray drift and run-off mitigation was considered for the run-off scenarios (VFS).~~

Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-78:7 day TWA PECsw for vines (early application)

Vines (early application)								
Scenario	Single application PEC_{SW} [µg/L]			Multiple application PEC_{SW} [µg/L]				
	Step 3	Step 4		Step 3	Step 4			
		10 m *	10 m **		10 m *	10 m **	10 m ***	20 m **
D6 Ditch	**0.163**#	**0.040**	-	**0.985**	**0.223**	-	-	-
R1 Pond	**0.033**	-	-	**0.119**	-	-	-	-
R1 Stream	0.043	0.034	0.017	**0.206**	-	**0.087**	**~~0.010~~**	**0.044**
R2 Stream	0.012	0.004	-	0.061	0.061	0.027	**~~0.007~~**	-
R3 Stream	0.039	0.011	-	**0.097**	**0.027**	-	-	-
R4 Stream	0.155	0.155	0.069	**0.738**	-	**0.326**	**~~0.007~~**	**0.168**

* Mitigation: 10 m spray drift.

** Spray drift and run-off mitigation was considered (manual).

~~*** Spray drift and run-off mitigation was considered (VFS).~~

[#] Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

Table B.8.5-79:7 day TWA PECsw for vines (late application)

Vines (late application)										
Scenario	Single application PEC_{SW} [µg/L]			Multiple application PEC_{SW} [µg/L]						
	Step 3	Step 4		Step 3	Step 4					
		10 m (drift)	20 m (drift)		10 m (drift)	10 m *	10 m **	20 m (drift)	20 m *	20 m **
D6 Ditch	**2.319**[#]	**0.529**	**0.191**	**2.372**	**0.539**	-	-	**0.194**	-	-
R1 Pond	**0.101**	-	-	**0.290**	-	-	-	-	-	-
R1 Stream	**0.070**	0.019	0.007	0.057	0.016	-	-	0.012	-	-
R2 Stream	0.048	0.014	0.005	0.040	0.011	-	-	0.004	-	-
R3 Stream	**0.173**	0.105	0.105	**0.497**	**0.394**	**0.197**	~~0.039~~	**0.369**	**0.096**	~~0.014~~
R4 Stream	**0.069**	0.019	0.014	**0.337**	-	**0.141**	~~0.016~~	-	**0.071**	~~0.006~~

* Spray drift and run-off mitigation was considered (manual).

~~** Spray drift and run-off mitigation was considered (VFS).~~

[#] Figures in bold are those obtained using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days.

III. CONCLUSION

Calculations of PECsw and PECsed for the application of zoxamide to potatoes and vines have been undertaken using the FOCUS surface water scenarios. At FOCUS Step 3, the maximum PEC_{sw} in surface water were 0.035 to ~~4.28~~ 3.54 µg/L. Step 4 simulations were run for both crops with 10 and 20 m buffer zones. For single applications to potatoes a 10 m buffer, in some instances including a 10 m vegetative strip were required to achieve concentrations below 0.35 µg/L. For multiple application to potatoes and applications to vines (single and multiple, early and late) 10 m or 20 m buffers, in some instances with the associated vegetative strips were necessary to achieve concentrations below 0.35 µg/L. However, if simulations with VFSmod module are waived PEC_{sw} for R1 (potatoes, multiple) and R4 (vines early and late, multiple) scenarios will result in concentrations above 0.35 µg/L. Where exposure was due to drainage (D6 ditch, 2nd application to potatoes) mitigation was not possible as this is not incorporated within the FOCUS models.

RMS comment:

Predicted environmental concentrations in surface water (PECsw) and sediment (PECsed) were calculated for zoxamide following application of the formulated product Zoxium 240 SC to potatoes and vines under European conditions.

In order to double-check PEC values provided by applicant RMS decided to re-run Step 3 simulations as a result similar PECs were obtained, except for potatoes with D6 (2nd) scenario (for the simulations using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days considerably lower concentrations were obtained), see tables below.

FOCUS Step 3 PEC values of zoxamide after single application to potatoes using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days

Scenario	PEC	Applicant	SPPS	
		MACRO 5.5.4	MACRO 5.5.4	MACRO 5.5.3
D6 (1st)	PECsw [µg/L]	0.937 sp*	0.937 sp	0.937 sp
		23-Jun-86**	23-Jun-86	23-Jun-86
	PECsed [µg/kg]	0.306	0.306	0.306
D6 (2nd)	PECsw [µg/L]	**1.409** d	**0.938** sp	**0.934** sp
		30-Oct-86	22-Oct-86	22-Oct-86
	PECsed [µg/kg]	0.353	0.353	0.279

SPPS - State Plant Protection Service

* - route of entry (sp - spray drift, d - drainage)

** - date of max. PECsw

FOCUS Step 3 PEC values of zoxamide after multiple application to potatoes using a $DT_{50water}$ of 1000 days and a DT_{50sed} of 6.4 days

Scenario	PEC	Applicant	SPPS	
		MACRO 5.5.4	MACRO 5.5.4	MACRO 5.5.3
D6 (1st)	PECsw [µg/L]	0.605 sp	0.605 sp	0.605 sp
		17-May-86	17-May-86	17-May-86
	PECsed [µg/kg]	0.251	0.251	0.251
D6 (2nd)	PECsw [µg/L]	**4.281** d	**1.334** d	**1.370** d
		30-Oct-86	30-Oct-86	30-Oct-86
	PECsed [µg/kg]	0.863	0.354	0.367

Simulations of RMS were done using the same input parameters, application data (dose, appl. dates) and model versions (SWASH v.3.1, PRZM V.3.1.1, MACRO v.5.5.4 and TOXWA V.3.3.1.) as in study *Callow B., Montesano V. (2015)*. Moreover additional modelling with previous version of MACRO model (v.5.5.3) on another computer was carried out to double-check the simulations of RMS.

Although it is not fully clear what could be causing the differences in the results, RMS believes it has done it's modelling thoroughly and even double-checked it, hence it was decided to discard PECs of D6 (2nd) scenario provided by applicant and replace them with values obtained by RMS using MACRO v.5.5.4.

In addition, RMS would like to note that VFSmod module is not a validated tool at EU level, therefore conclusions on the risk assessment should be based on PEC_{SW} and PEC_{SED} refinement according to the FOCUS Landscape and mitigation (2007) only.

B.8.6 Fate and behaviour in air

B.8.6.1 Route and rate of degradation in air and transport via air

Environmental fate studies using the formulation Zoxium 240 SC were not conducted as data from studies with the active substance, zoxamide, are available and adequate to enable extrapolation to the

behaviour of the formulated product. Neither the type of plant protection product nor its ingredients and physical properties are expected to affect the substances volatility.

The vapour pressure of zoxamide is 1.33 x 10^{-5} Pa at 25°C and the water solubility at 20°C is 0.68 mg/l (pH 4-9). Using these values a Henry's Law constant of <6.59 x 10^{-3} Pa/mol.m^3 was derived. These figures suggest that zoxamide is only very slightly volatile. Volatilisation of zoxamide from soil and leaf surfaces under standardised climatic conditions was investigated. Losses were very low with losses of 5.1% AR from leaf surfaces and 3.9% AR from soil after 24 hours.

Concentrations of zoxamide in air will therefore be negligible. A theoretical calculation of the photo-oxidation of zoxamide in the atmosphere, using the method of Atkinson (1988), gave a DT_{50} of 7.5 hours. Therefore in the unlikely event of residues entering air, they will be rapidly degraded.

B.8.6.2 Predicted environmental concentrations from airborne transport

The properties of zoxamide indicate that it is only very slightly volatile and this is confirmed by volatilisation studies. Concentrations of zoxamide in air will therefore be negligible. Zoxamide is also rapidly degraded in air (DT_{50} 7.5 hours) and thus the potential for airborne transport will also be very low.

B.8.7 Predicted environmental concentrations from other routes of exposure

Not applicable.

B.8.8 References relied on

Data point	Author(s)	Year	Title Source (where different from company) Company, Report No, GLP or GEP status (where relevant), Published or not	Data Protection Claimed Y/N	Owner	Previous Evaluation Y/N
KCP, 9.2.4.1	Callow, B. and Montesano, V.	2015a	Predicted environmental concentrations of Zoxamide and its metabolites in groundwater in the EU using the FOCUS PELMO 5.5.3 and FOCUS PEARL 4.4.4 models. Exponent International Ltd, Harrogate, UK Report No: 0907598.UK0-9393 Not GLP, Not published	Y	Gowan	N
KCP, 9.2.5	Callow, B. and Montesano, V.	2014	Predicted environmental concentrations of Zoxamide in surface water in the EU using the FOCUS surface water scenarios. Exponent International Ltd, Harrogate, UK Report No: 0907598.UK0-4493 Not GLP, Not published	Y	Gowan	N
KCP, 9.2.5	Callow, B. and Montesano, V.	2015b	Predicted environmental concentrations of Zoxamide in surface water in the EU using the FOCUS surface water scenarios – Additional simulations. Exponent International Ltd, Harrogate, UK Report No: 0907598.UK0-7794 Not GLP, Not published	Y	Gowan	N