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Propiconazole

Predicted environmental concentrations in groundwater after application of propiconazole to tree crops and cereals

FOCUS groundwater calculations

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Summary

This report addresses the potential for propiconazole to leach through soil after applications to tree crops and cereals according to Good Agricultural Practice (GAP). Predicted environmental concentrations in leachate/groundwater (PEC_{GW}) were determined for the active substance propiconazole using FOCUS PEARL v.5.5.5. and FOCUS PELMO v.6.6.4 with the FOCUS groundwater scenarios. As PEC_{GW} values were <0.001 µg/L, no further modelling with FOCUS MACRO v.5.5.4 was considered necessary. A summary of the substance specific input data is shown in the following table.

Summary of input data used in the modelling

Parameter	Propiconazole	Remarks
Molecular weight [g/mol]	342.2	-
Water solubility at 20°C [mg/L]	150	At pH 6.9: EU dRAR (2017)
Vapor pressure at 20°C [Pa]	0	Worst-case default
DT_{50} (soil) [d]	82.9	Geometric mean, n=11, laboratory DT_{50} Normalized to 20°C, pF2 EFSA Journal 2017; 15(7): 4887
K_{FOC} [L/kg]	835	Geometric mean, n=9 EFSA Journal 2017; 15(7): 4887
K_{FOM} [L/kg]	484	K_{FOC} / 1.724
1/n [-]	0.86	Arithmetic mean, n=9 EFSA Journal 2017; 15(7): 4887
Plant uptake factor (PUF/TSCF) [-]	0	FOCUS default

The GAP considered here is multiple post-emergence applications to tree and cereal crops. Applications to tree crops will be between BBCH 10 and 97 and to cereals between BBCH 25 and 59. For modelling, uses were grouped and the maximum application rate, maximum number of applications and minimum interval between applications was input to cover the risk envelope for all GAP uses. For tree crops the FOCUS crop 'apples' was used and for cereal crops both winter and spring cereals was modelled. For each type of crop early and late applications were modelled to cover the risk envelope for all uses; for tree crops (FOCUS crop apples) mid-season applications were also simulated which was chosen as mid-way between the early and late season modelling. The application dates used for modelling were based on the earliest or latest growth stage with the AppDate (v 3.06, 2019) tool used to obtain application dates relevant to the growth stage for the different EU FOCUS scenarios. Applications are intended to be in South Africa, which will have different agricultural seasons when related to the calendar month compared to Europe; however, it is considered that the application timings modelled are relative to the FOCUS emergence and harvest dates and so will also be relative and applicable to the South African agricultural seasons. The modelling therefore, is considered to cover the risk envelope for all uses in the GAP Table.

In the simulations, propiconazole was applied directly to soil. As a worst-case no crop interception was considered; however, in accordance with the latest FOCUS guidance (FOCUS 2023), as a minimum, at least 60 % crop interception could be applied to tree crops (>BBCH 10) and 20 % crop interception could be applied to cereals (>BBCH 20). Therefore, the modelling is conservative. Application of propiconazole was simulated assuming 26 years of continuous cropping and annual application of the compound.

GAPs for propiconazole used for modelling

Crop	FOCUS crop or surrogate	Growth stage [BBCH]	Application rate [g/ha] **	No. of appl.	Interval [d]**	Crop interception [%] *	Effective rate to soil [g/ha]	Remarks
Tree Crops	Apple	BBCH 10 - 97	250	3	7	0	250	-
Cereals	Spring and Winter Cereals	BBCH 25 - 59	150	2	10	0	150	-

*As a worst-case no crop interception was considered. **The GAPs used for modelling considered the maximum application rate and number of applications with the minimum interval used to cover the risk envelope for all uses. An early and late application was considered. For tree crops a mid-season application was also considered.

Absolute application dates used in the simulations

Crop	Scenario	Early Application*	Mid-Season*	Late Application*
Tree Crops (FOCUS crop Apples)	Châteaudun	02 Apr, 09 Apr, 16 Apr	01 Jul, 08 Jul, 15 Jul	24 Sep, 01 Oct, 08 Oct
	Hamburg	16 Apr, 23 Apr, 30 Apr	01 Jul, 08 Jul, 15 Jul	23 Oct, 30 Oct, 06 Nov
	Jokioinen	11 May, 18 May, 25 May	01 Jul, 08 Jul, 15 Jul	08 Oct, 15 Oct, 22 Oct
	Kremsmünster	16 Apr, 23 Apr, 30 Apr	01 Jul, 08 Jul, 15 Jul	23 Oct, 30 Oct, 06 Nov
	Okehampton	26 Mar, 02 Apr, 09 Apr	01 Jul, 08 Jul, 15 Jul	08 Sep, 15 Sep, 22 Sep
	Piacenza	02 Apr, 09 Apr, 16 Apr	01 Jul, 08 Jul, 15 Jul	25 Oct, 01 Nov, 08 Nov
	Porto	16 Mar, 23 Mar, 30 Mar	01 Jul, 08 Jul, 15 Jul	24 Oct, 31 Oct, 07 Nov
	Sevilla	16 Mar, 23 Mar, 30 Mar	01 Jul, 08 Jul, 15 Jul	08 Oct, 15 Oct, 22 Oct
	Thiva	16 Mar, 23 Mar, 30 Mar	01 Jul, 08 Jul, 15 Jul	13 Oct, 20 Oct, 27 Oct
Spring Cereals	Châteaudun	07 Apr, 17 Apr	-	29 May, 08 Jun
	Hamburg	21 Apr, 01 May		25 May, 04 Jun
	Jokioinen	01 Jun, 11 Jun		19 Jun, 29 Jun
	Kremsmünster	21 Apr, 01 May		25 May, 04 Jun
	Okehampton	17 Apr, 27 Apr		11 May, 21 May
	Porto	07 Apr, 17 Apr		29 May, 08 Jun
Winter Cereals	Châteaudun	10 Apr, 20 Apr	-	19 May, 29 May
	Hamburg	29 Apr, 09 May		21 May, 31 May
	Jokioinen	09 May, 19 May		14 Jun, 24 Jun
	Kremsmünster	19 Apr, 29 Apr		25 May, 04 Jun
	Okehampton	16 Apr, 26 Apr		04 May, 14 May
	Piacenza	14 Mar, 24 Mar		28 Apr, 08 May
	Porto	15 Jan, 25 Jan		17 Apr, 27 Apr
	Sevilla	28 Dec, 07 Jan**		16 Feb, 26 Feb
	Thiva	06 Jan, 16 Jan		18 Mar, 28 Mar

*Application dates were chosen by the AppDate tool: Early applications were based on BBCH 10 for tree crops and BBCH 25 for cereals. Late applications ended at BBCH 97 for tree crops and BBCH 59 for cereals. For tree crops a mid-season application was modelled in July; ** As the dates span the end of the year, for FOCUS PELMO modelling applications at the end of a calendar year were simulated.

Conclusion

All PEC_{GW} values for propiconazole were <0.001 µg/L for all crops and FOCUS scenarios modelled. This demonstrates an acceptable risk to groundwater following applications made in accordance with each GAP.

1. Introduction

Propiconazole is a fungicide used on tree and cereal crops. This report addresses the potential for propiconazole to leach through soil after post-emergence applications to tree crops between BBCH 10 and 97 and cereals between BBCH 25 and 59 according to Good Agricultural Practice (GAP).

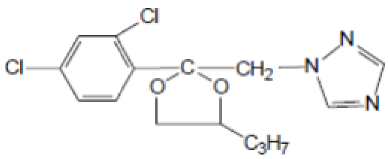
Predicted environmental concentrations in leachate/groundwater (PEC_{GW}) were determined in the current work for the active substance propiconazole using FOCUS PEARL v.5.5.5 and FOCUS PELMO v.6.6.4 with the FOCUS groundwater scenarios. FOCUS MACRO 5.5.4 modelling was not performed as all PEC_{GW} values with FOCUS PEARL and PELMO were <0.001 µg/L.

2. Properties of the Compound

2.1 Structure and nomenclature

The structure, chemical name and some basic chemical information for the test compound are shown in the following overview:

Table 2.1-1: Nomenclature and structure of the test compound

Common name:	Propiconazole	
Chemical name (IUPAC):	(2*RS*,4*RS*;2*RS*,4*SR*)-1-[2-(2,4-dichlorophenyl)-4-propyl-1,3-dioxolan-2-ylmethyl]-1*H*-1,2,4-triazole	
Molecular mass:	342.2 g/mol	
Molecular formula:	$C_{15}H_{17}Cl_2N_3O_2$	

2.2 Substance specific input parameters

<u>*Water Solubility and Vapour Pressure*</u>
The water solubility of propiconazole was measured in at 20°C and pH 6.9 to be 150 mg/L in the OECD guideline 105 study of Jäkel (1987) as detailed in the EU dRAR for propiconazole (2017). For modelling purposes, the vapour pressure of propiconazole was set to 0 Pa as this is a worst-case (i.e. 100 % propiconazole will stay in the soil layers and be available for leaching).

<u>*Aerobic degradation in soil*</u>
The aerobic degradation endpoints were taken from the European evaluation of the active substance and the soil metabolism studies submitted and presented in the EU draft Renewal Assessment Report and EFSA Journal (2017; 15(7):4887). The table below (Table 2.2-1) details the degradation endpoints and the overall geometric mean which was used for the groundwater exposure assessment. It should be noted that degradation in the field was faster than the laboratory with a non-normalised DT_{50} value of 25.4 days (n=6).

Table 2.2-1: Summary of aerobic degradation modelling endpoints for propiconazole

Soil type	pH[a)]	t. ºC / % MWHC	DT_{50} / DT_{90} (d)	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation	Reference (as detailed in dRAR, 2017)
Silt loam (Les Barges)	7.6	25/23 / 70% FC	78.3 / 260	115	4.01	SFO	Keller (1980)
Loamy sand	7.2	25 / No data	39.7 / 132	63.8	5.48	SFO	Keller (1981)
Sandy loam	6.9	25 / No data	55.9 / 399	-	2.88	FOMC	Keller (1981)
			-	110	7.10	SFO	
Silt loam (Les Barges)	7.4	25/23 / 75% FC	38.4 / 246	-	1.08	FOMC	Keller (1982)
			-	67.5	7.47	SFO	
Silt loam (Les Evouettes)	5.4	20/27 60% FC	67.4 / 224	67.4	7.07	SFO	Müller-Kallert (1992)
Silt loam (Les Evouettes)	5.4	20/27 60% FC	40.6 / 135	40.6	8.62	SFO	Müller-Kallert (1992)
Silt loam (Gartenacker)	7.2 in KCl	20/27 40% MWHC	26.6 / 107	-	1.58	FOMC	Adam (2001)
			-	28.8	2.84	SFO	
Sandy loam (Pappleacker)	7.3 in H_2O	20 / pF2	71.1 / 236	71.1	1.50	SFO	Edwards (2007)
Silt loam (Krone)	5.5 in H_2O	20 / pF2	131 / 999	374	1.62	SFO	Edwards (2007)
Silty clay (Champaign)_	7.5 in H_2O	20 / pF2	126 / >1000	398	2.50	SFO	Edwards (2007)
Loamy sand (Pappelacker)	7.2 in H_2O	20 / pF2	28.0 / 92.9	28	8.30	SFO	Miner (2013)
Geometric mean (if not pH dependent) (n=11)				**82.9**			
pH dependence				No			

a) Medium stated if reported;

Half-lives were normalised to 20°C using a Q_{10} of 2.58 and a moisture content of 10 kPa (pF2) according to FOCUS guidance.

The DT_{50} values for soils from the same location were not averaged first before taking an overall geometric mean as the studies were conducted by different authors or in different years and therefore, they are not true replicates.

Adsorption to soil

The soil adsorption data were taken from the European evaluation of the active substance and the soil adsorption/desorption studies submitted and presented in the draft Renewal Assessment Report and EFSA Journal (2017; 15(7):4887). The table below details the soil adsorption endpoints and the overall mean values which were used for the groundwater exposure assessment.

Table 2.2-2: Summary of soil adsorption parameters for propiconazole

Soil Location	Soil Type	OC (%)	pH $CaCl_2$ (-)	K_F (mL/g)	K_{FOC} (mL/g)	1/n	Reference (as detailed in dRAR, 2017)
Collombey	Sand	1.28	7.8	8.48	665	0.86	Burkhard (1980)
Vetroz	Sandy clay loam	3.25	6.7	59.03	1817	0.88	Burkhard (1980)
Les Evouettes	Loam	2.09	6.1	26.20	1255	0.81	Burkhard (1980)
Lakeland	Sand	0.70	6.3	10.96	1575	0.85	Burkhard (1980)
USA	Sand	0.17	5.4	1.20	690	0.895	Saxena (1988)
USA	Silt loam	0.64	7.0	2.81	440	0.899	Saxena (1988)
USA	Sandy loam	1.16	7.5	4.49	387	0.894	Saxena (1988)
USA	Silty clay loam	1.45	6.8	8.88	612	0.831	Saxena (1988)
USA	Clay loam	0.81	7.8	9.34	1150	0.841	Saxena (1988)
Geometric Mean (n=9)					**835**	-	
Arithmetic Mean (n=9)					-	**0.86**	
pH dependence					No		

Summary of substance specific input parameters

A summary of substance specific input parameters is detailed below. With the exception of the input parameters specified, all other modelling inputs were as per the respective model defaults.

Table 2.2-3: Overview of input data - propiconazole

Parameter	**Propiconazole**	**Remarks**
Molecular weight [g/mol]	351.37	-
Water solubility at 20°C [mg/L]	150	At pH 6.9: EU dRAR (2017)
PELMO input: water solubility at 30 °C [mg/L]	300	Factor of 2 assumed for an increase of 10 °C in temperature*
Vapor pressure at 20°C [Pa]	0	Worst-case default
PELMO input: Vapour pressure at 30 °C [Pa]	0	Worst-case default
DT_{50} (soil) [d]	82.9	Geometric mean, n=11, laboratory DT_{50} Normalized to 20°C, pF2 EFSA Journal 2017; 15(7): 4887
Transformation rate for PELMO	0.008361 to sink	Ln(2)/DT_{50}
K_{FOC} [L/kg]	835	Geometric mean, n=9 EFSA Journal 2017; 15(7): 4887
K_{FOM} [L/kg]	484.3	K_{FOC} / 1.724
1/n [-]	0.86	Arithmetic mean, n=9 EFSA Journal 2017; 15(7): 4887
Plant uptake factor	0	FOCUS default

* As recommended by the FOCUS PELMO manual v5.0

3. FOCUS Calculations

3.1 Models and scenarios

Several numerical leaching models have been recommended by the FOCUS groundwater group for registration purposes. For this assessment, FOCUS PEARL 5.5.5 and FOCUS PELMO 6.6.4 were selected for groundwater calculations.

3.1.1 FOCUS groundwater scenarios

The FOCUS Groundwater Scenario Workgroup defined nine standard modelling scenarios for use in the registration of plant protection products according to according to Regulation EC1107/2009 replacing Council Directive 91/414/EEC. These FOCUS scenarios are designed to describe an overall vulnerability approximating the 90th percentile of all possible situations, in order to represent realistic worst-case combinations of soil and climatic conditions for leaching in the EU (FOCUS 2000, 2014, 2023). Each scenario is parameterized for crops that are relevant to the agro-climatic region represented by the scenario. An overview of each of the scenarios is given in the following table.

Table 3.1.1-1: Overview of FOCUS groundwater scenarios

Scenario	**Mean annual climatic conditions**		**Top soil properties**			
	Temperature [°C]	**Rainfall [mm]**	**Texture**	**Organic carbon [%]**	**pH [KCl]**	**Clay [%]****
Châteaudun	11.3	648+I	silty clay loam	1.4	7.3	30
Hamburg	9.0	786	sandy loam	1.5	5.7	7.2
Jokioinen	4.1	650	loamy sand	4.1	5.5	3.6
Kremsmünster	8.6	899	loam/silt loam	2.1	7.0	14
Okehampton	10.2	1038	loam	2.2	5.1	18
Piacenza	13.2	857+I	loam	1.3	6.3	15
Porto	14.8	1150+I	loam	1.4	4.2	10
Sevilla	17.9	493+I	silt loam	0.9	6.6	14
Thiva	16.2	500+I	loam	0.7	7.0	25.3

**I = scenario also includes crop specific irrigation; **clay content defined as fraction < 2 µm*

3.1.2 FOCUS models

PELMO (PEsticide Leaching Model) is a computer simulation model that is based on a capacity-based water transport concept which had previously been used in PRZM (Pesticide Root Zone Model). In comparison to PRZM, PELMO has a more detailed plant growth model and a more flexible scheme for dealing with metabolites. PELMO has been validated for regulatory use (Klein 1994, Klein *et al.* 1997) and is one of the models for which the FOCUS groundwater scenarios have been parameterized. The version of the model used for the calculations presented here was FOCUS-PELMO v.6.6.4.

PEARL (Pesticide Emission Assessment at Regional and Local scales) is a computer simulation model that describes the fate of a pesticide and relevant transformation products in the soil-plant system using the Richards equation for soil water movement (Tiktak *et al.* 2000, Leistra *et al.* 2000). It is one of the models for which all of the FOCUS groundwater scenarios have been parameterized. The version of the model used for the calculations presented here was FOCUS-PEARL v.5.5.5.

3.2 Intended uses and crop grouping

3.2.1 GAP, crop types and selection of FOCUS crop groups

The GAP considered here is multiple post-emergence applications to tree and cereal crops. Applications to tree crops will be BBCH 10 and 97 and to cereals between BBCH 25 and 59. The table below provides a summary of the overall proposed GAP.

Table 3.2.1-1: GAPs for propiconazole (field uses)

Use no. (GAP)	Crop	Pests or Group of pests controlled	Method/Kind	Growth stage [BBCH]	Maximum Application rate [g/ha]	No. of appl.	Min Interval [d]	PHI [d]
1	Pecan nuts	Scab (*Fusicladium effusum*)	Foliar Spray (ground appln.)	1st appln. BBCH 15 2nd appln. 10 days after T1 3rd appln. 21 days after T2	250	3	10	90
2	Mango	Powdery mildew (*Oidium mangiferae*)	Foliar Spray (ground appln.)	BBCH 65-70	75	2	10	120
3	Apricot, Cherry, Peach Plum	Blossom blight (*Monilinia laxa*)	Foliar Spray (ground appln.)	BBCH 55-69	100	3	7	10/14
4	Cherry, Peach	Powdery mildew (*Sphaerotheca pannosa*)	Foliar Spray (ground appln.)	BBCH 10-39 BBCH 60 BBCH 65 BBCH 69 BBCH 91-97 **	150	3	14	10/14
5	Wheat*	Stem, foliar and ear diseases	Foliar Spray (ground appln.)	BBCH 29-59	150	2	10	40
6	Barley*	Foliar diseases	Foliar Spray (ground appln.)	BBCH 25-59	125	2	10	40

*Applications can be aerial
** GAP specifies three applications; however, the applications should be made in the specified window; for applications BBCH 91-97, it should be noted that FOCUS considers this application to be after harvest, whereas the GAP specifies a Pre Harvest Interval of 10-14 days; however, a post-harvest application for modelling should be worst-case.

For modelling purposes, the GAP was grouped into tree crops and cereals, with the maximum application rate, maximum number of applications and minimum interval between applications considered to cover the risk envelope for all GAP uses. For tree crops the FOCUS crop 'apples' was used and for cereal crops both winter and spring cereals was modelled. The selected FOCUS crop groups were intended to cover the GAPs for all applications to tree and cereal crops with the respective FOCUS calculations. For each type of crop early and late applications were modelled to cover the risk envelope for all uses; for tree crops mid-season applications were also modelled (the dates being chosen to be approximately mid-way between early and late applications). The application dates used for modelling were based on the earliest or latest growth stage. Although applications will be made in South Africa which have different calendar timings for planting and harvesting crops compared to Europe, the AppDate (v 3.06, 2019) tool was used to obtain application dates relevant to each EU FOCUS growth stage for the different FOCUS scenarios. Thus, although the calendar months of crop growth will be different in South Africa, the application timing, relative to the FOCUS emergence and harvest dates will also be relative to the South African agricultural seasons. The modelling therefore, is considered to cover the risk envelope for all uses in the GAPs.

In the simulations, propiconazole was applied directly to soil. As a worst-case no crop interception was considered; however, in accordance with the latest FOCUS guidance (FOCUS 2023), as a minimum, at least 60 % crop interception could be applied to tree crops (>BBCH 10) and 20 % crop interception could be applied to cereals (>BBCH 20). Therefore, the modelling is conservative. Application of propiconazole was simulated assuming 26 years of continuous cropping and annual application of the compound.

Table 3.2.1-1: GAPs for propiconazole used for modelling and intended to cover the risk envelope for application to all GAPs

Crop	FOCUS crop or surrogate	Growth stage [BBCH]	Application rate [g/ha]**	No. of appl.**	Interval [d]**	Crop interception [%]*	Effective rate to soil [g/ha]	Remarks
Tree Crops	Apples (pome/stone fruit)	BBCH 10 - 97	250	3	7	0	250	-
Cereals	Spring and Winter Cereals	BBCH 25 - 59	150	2	10	0	150	-

*As a worst-case no crop interception was considered. **The GAPs used for modelling considered the maximum application rate and number of applications with the minimum interval used to cover the risk envelope for all uses. An early and late application was considered. For pome/stone fruit a mid-season application was also considered.

Table 3.2.1-2: Absolute Application dates used in the simulations

Crop	Scenario	Early Application *	Mid-Season *	Late Application *
Apples	Châteaudun	02 Apr, 09 Apr, 16 Apr	01 Jul, 08 Jul, 15 Jul	24 Sep, 01 Oct, 08 Oct
	Hamburg	16 Apr, 23 Apr, 30 Apr	01 Jul, 08 Jul, 15 Jul	23 Oct, 30 Oct, 06 Nov
	Jokioinen	11 May, 18 May, 25 May	01 Jul, 08 Jul, 15 Jul	08 Oct, 15 Oct, 22 Oct
	Kremsmünster	16 Apr, 23 Apr, 30 Apr	01 Jul, 08 Jul, 15 Jul	23 Oct, 30 Oct, 06 Nov
	Okehampton	26 Mar, 02 Apr, 09 Apr	01 Jul, 08 Jul, 15 Jul	08 Sep, 15 Sep, 22 Sep
	Piacenza	02 Apr, 09 Apr, 16 Apr	01 Jul, 08 Jul, 15 Jul	25 Oct, 01 Nov, 08 Nov
	Porto	16 Mar, 23 Mar, 30 Mar	01 Jul, 08 Jul, 15 Jul	24 Oct, 31 Oct, 07 Nov
	Sevilla	16 Mar, 23 Mar, 30 Mar	01 Jul, 08 Jul, 15 Jul	08 Oct, 15 Oct, 22 Oct
	Thiva	16 Mar, 23 Mar, 30 Mar	01 Jul, 08 Jul, 15 Jul	13 Oct, 20 Oct, 27 Oct
Spring Cereals	Châteaudun	07 Apr, 17 Apr	-	29 May, 08 Jun
	Hamburg	21 Apr, 01 May		25 May, 04 Jun
	Jokioinen	01 Jun, 11 Jun		19 Jun, 29 Jun
	Kremsmünster	21 Apr, 01 May		25 May, 04 Jun
	Okehampton	17 Apr, 27 Apr		11 May, 21 May
	Porto	07 Apr, 17 Apr		29 May, 08 Jun
Winter Cereals	Châteaudun	10 Apr, 20 Apr	-	19 May, 29 May
	Hamburg	29 Apr, 09 May		21 May, 31 May
	Jokioinen	09 May, 19 May		14 Jun, 24 Jun
	Kremsmünster	19 Apr, 29 Apr		25 May, 04 Jun
	Okehampton	16 Apr, 26 Apr		04 May, 14 May
	Piacenza	14 Mar, 24 Mar		28 Apr, 08 May
	Porto	15 Jan, 25 Jan		17 Apr, 27 Apr
	Sevilla	28 Dec, 07 Jan **		16 Feb, 26 Feb
	Thiva	06 Jan, 16 Jan		18 Mar, 28 Mar

*Application dates were chosen by the AppDate tool: Early applications were based on BBCH 10 for tree crops and BBCH 25 for cereals. Late applications ended at BBCH 97 for tree crops and BBCH 59 for cereals. For tree crops a mid-season application was modelled in July; ** As the dates span the end of the year, for FOCUS PELMO modelling applications at the end of a calendar year were simulated.

4. Results

Simulations were conducted over a period of 26 years including a 6 years warm-up phase. The predicted concentrations in groundwater (PEC_{GW}) are summarized in the tables below. Appendix 1 provides example FOCUS PEARL and PELMO files.

Table 4-1: PEC_{GW} values for propiconazole

		80th Percentile PEC_{GW} at 1 m Soil Depth (µg/L)					
		FOCUS PEARL v.5.5.5			FOCUS PELMO v.6.6.4		
	Scenario	Early Season	Mid Season	Late Season	Early Season	Mid Season	Late Season
Apples	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	<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	<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
Spring Cereals	Châteaudun	<0.001	-	<0.001	<0.001	-	<0.001
	Hamburg	<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
	Okehampton	<0.001		<0.001	<0.001		<0.001
	Porto	<0.001		<0.001	<0.001		<0.001
Winter Cereals	Châteaudun	<0.001	-	<0.001	<0.001	-	<0.001
	Hamburg	<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
	Okehampton	<0.001		<0.001	<0.001		<0.001
	Piacenza	<0.001		<0.001	<0.001		<0.001
	Porto	<0.001		<0.001	<0.001		<0.001
	Sevilla	<0.001		<0.001	<0.001		<0.001
	Thiva	<0.001		<0.001	<0.001		<0.001

Conclusion

All PEC_{GW} values for propiconazole were ≤0.001 µg/L for all crops and all FOCUS scenarios modelled. This demonstrates an acceptable risk to groundwater following applications made in accordance with each GAP.

5. References

5.1 Standard bibliography

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Appendices

A1 Example model files

A1.1 PEARL

Listing A1.1-1: PEARL report-file, Châteaudun, apples application at BBCH 10

```
* PEARL REPORT: Header
* Results from the PEARL model  (c) WENR, PBL and RIVM
* PEARL kernel version       : 3.2.20
* SWAP kernel version        : swap3237
* PEARL created on           : 14-Sep-2020
*
* PEARL was called from      : FOCUSPEARL,version 5.5.5
* Working directory          : C:\Users\etallentire\Documents\PesticideModels\FOCUSPEARL_5.5.5\FOCUSPEARL
\3
* Run ID                     : 3
* Input file generated on    : 13-08-2024
* ------------------------------------------------------------------------------
*
* ExposureType          : Groundwater
* Scenario data subset  : FOCUS Groundwater version 5
* Location              : CHATEAUDUN
* Meteo station         : chat-m
* Soil type             : CHAT-S_Soil
* Crop calendar         : CHAT-APPLES
* Substance             : PPCZ
* Application scheme    : Apple_E_ChPia
* Deposition scheme     : No
* Irrigation scheme     : SURFACE_WEEKLY
*
* End of PEARL REPORT: Header

* PEARL REPORT: Leaching
* Start date      :   01-Jan-1901
* End date        :   31-Dec-1926
* Target depth    :   1.00 m
* Annual application to the soil surface at 02-Apr; dosage =     0.2500 kg.ha-1
* Annual application to the soil surface at 09-Apr; dosage =     0.2500 kg.ha-1
* Annual application to the soil surface at 16-Apr; dosage =     0.2500 kg.ha-1

* Leaching summary for compound PPCZ
* Molar mass (g.mol-1)                              :    351.4
* Saturated vapour pressure (Pa)                    :   0.00    ; measured at (C)  20.0
* Solubility in water (mg.L-1)                      :   150.    ; measured at (C)  20.0
* Half-life (d) in soil                             :     82.9; measured at (C)  20.0
* Kom (coef. for sorption on soil organic matter) (L.kg-1) :    484.3
* KF    (overall sorption coefficient of the soil target layer) (L.kg-1) :      6.39
* Freundlich exponent (-)                           :     0.86
* Plant uptake factor (-)                           :     0.00
* -----------------------------------------------------------------------------------------------------
---------------------------
* Period        From          To              Water percolated              Substance leached
   Average substance
* number                               below target depth (mm)     below target depth (kg/ha)         co
ncentration in water
*                                                                                                     at
 target depth (ug/L)
* -----------------------------------------------------------------------------------------------------
---------------------------
   1     01-Jan-1907 31-Dec-1907                   286.588                    0.0000000                   0.000
   2     01-Jan-1908 31-Dec-1908                   137.939                    0.0000000                   0.000
   3     01-Jan-1909 31-Dec-1909                   287.900                    0.0000000                   0.000
   4     01-Jan-1910 31-Dec-1910                   254.983                    0.0000000                   0.000
   5     01-Jan-1911 31-Dec-1911                   366.947                    0.0000000                   0.000
   6     01-Jan-1912 31-Dec-1912                   227.391                    0.0000000                   0.000
   7     01-Jan-1913 31-Dec-1913                   290.113                    0.0000000                   0.000
   8     01-Jan-1914 31-Dec-1914                   331.804                    0.0000000                   0.000
   9     01-Jan-1915 31-Dec-1915                   153.263                    0.0000000                   0.000
  10     01-Jan-1916 31-Dec-1916                   379.816                    0.0000000                   0.000
  11     01-Jan-1917 31-Dec-1917                   144.231                    0.0000000                   0.000
  12     01-Jan-1918 31-Dec-1918                   201.575                    0.0000000                   0.000
  13     01-Jan-1919 31-Dec-1919                   265.621                    0.0000000                   0.000
  14     01-Jan-1920 31-Dec-1920                   275.476                    0.0000000                   0.000
  15     01-Jan-1921 31-Dec-1921                   135.831                    0.0000000                   0.000
  16     01-Jan-1922 31-Dec-1922                   117.054                    0.0000000                   0.000
```

```
 17     01-Jan-1923 31-Dec-1923                    159.272                    0.0000000                       0.000
 18     01-Jan-1924 31-Dec-1924                    205.710                    0.0000000                       0.000
 19     01-Jan-1925 31-Dec-1925                    170.576                    0.0000000                       0.000
 20     01-Jan-1926 31-Dec-1926                    173.213                    0.0000000                       0.000

* The average concentration of PPCZ closest to the 80th percentile is      0.000000 ug/L

* End of PEARL REPORT: Leaching
```

A1.2 PELMO

Listing A1.2-1: PELMO .echo-file and sum file, Châteaudun, apples, application at BBCH 10

```
1
 ***********************************
 *                         *
 *   PESTICIDE LEACHING MODEL      *
 *   PELMO 5.0, DEC 2020          *
 *   FOCUSPELMO 6.6.4             *
 *                         *
 *                         *
 ***********************************


 DEVELOPED BY:
      U.S. ENVIRONMENTAL PROTECTION AGENCY
      OFFICE OF REASEARCH AND DEVELOPMENT
      ATHENS ENVIRONMENTAL RESEARCH LABORATORY
      ATHENS, GA.  30613
      404-546-3138
  AND
      ANDERSON-NICHOLS
      2666 EAST BAYSHORE RD.
      PALO ALTO, CA.  94303
  AND
      FRAUNHOFER INSTITUTE
      POSTFACH 1260
      D-57377 SCHMALLENBERG
      Tel + 49-2972-302-317
  AND
      SLFA Neustadt,
      DEPARTMENT ECOLOGY
      D-67435 NEUSTADT/WSTR.
      Tel ++ 49-6321-671-422


  PELMO 5.0,       DEC 2020


***************HYDROLOGY DATAS**************

         FOCUS GW Simulation: 6 warming-up years


         YEAR   1: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:01
         YEAR   2: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:02
         YEAR   3: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:03
         YEAR   4: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:04
         YEAR   5: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:05
         YEAR   6: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:06
         YEAR   7: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:07
         YEAR   8: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:08
         YEAR   9: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:09
         YEAR  10: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:10
         YEAR  11: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:11
         YEAR  12: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:12
         YEAR  13: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:13
         YEAR  14: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:14
         YEAR  15: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:15
         YEAR  16: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:16
         YEAR  17: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:17
         YEAR  18: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:18
         YEAR  19: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:19
         YEAR  20: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:20
         YEAR  21: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:21
         YEAR  22: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:22
         YEAR  23: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:23
         YEAR  24: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:24
         YEAR  25: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:25
         YEAR  26: Ver 4 Châteaudun scenario (48.05 N, 1.38 E))     Year:26



 HYDROLOGY AND SEDIMENT RELATED PARAMETERS
 ----------------------------------------

Variable time step

Pan Evaporation data are used.


  LATTITUDE OF THE LOCATION:  48.00

 CROPNAME                        GENERAL      Apples
```

```
 PAN COEFFICIENT FOR EVAPORATION (NO CROP)          1.000       1.000
 PAN COEFFICIENT FOR EVAPORATION (MID  SEASON)       1.000       1.100
 PAN COEFFICIENT FOR EVAPORATION (LATE SEASON)       1.000       0.8600
 FLAG FOR ET (0=EVAP,1=TEMP,2=EVAP/TEMP)                0
 DEPTH TO WHICH ET IS COMPUTED YEAR-ROUND [CM]        20.00
 SNOW MELT COEFFICIENT [CM/DEG-C-DAY]              0.4600
 INITIAL CROP NUMBER                              1
 INITIAL CROP CONDITION                             1



NO CALCULATION OF RUNOFF EVENTS
 CROP INFORMATION
 ----------------

      MAXIMUM                          IRRIGATION PERENNIAL        SURFACE
      INTERCEPT.MAXIMUM    MINIMUM   MAXIMUM          FLG(0=NO)  CROP            CONDITION                USLE COVER MANAGEMENT
 CROP   POTENTIAL ROOT DEPTH   LAI       LAI     WEIGHT    (1=CANOPY) (0=NO)          AFTER       AMC       RUNOFF CURVE NUMBERS     "C" FACTOR
 NUMBER  [CM]     [CM]      [-]      [-]     [KG/M**2]  2=DRIP)  (1=YES)            HARVEST            FALLOW    CROP  RESIDUE   FALLOW  CROP    RESIDUE   EXT.
COEFF.  SPRING POINT

                                                                       I        54      54      54
  24    0.0000     100.0    0.0000     4.000    0.0000       2       1              3       II         73      73      73   1.0000  1.0000  1.0000     0.39000
                                                                       III        86      86      86



   CROP ROTATION INFORMATION
   -------------------------

   CROP                       EMERGENCE          MATURATION        SENESCENCE          HARVEST
   NUMBER                        DATE              DATE              DATE               DATE

   Apples                     1 APR.,   1       31 MAY ,   1       1 SEP.,   1       1 OCT.,   1
   Apples                     1 APR.,   2       31 MAY ,   2       1 SEP.,   2       1 OCT.,   2
   Apples                     1 APR.,   3       31 MAY ,   3       1 SEP.,   3       1 OCT.,   3
   Apples                     1 APR.,   4       31 MAY ,   4       1 SEP.,   4       1 OCT.,   4
   Apples                     1 APR.,   5       31 MAY ,   5       1 SEP.,   5       1 OCT.,   5
   Apples                     1 APR.,   6       31 MAY ,   6       1 SEP.,   6       1 OCT.,   6
   Apples                     1 APR.,   7       31 MAY ,   7       1 SEP.,   7       1 OCT.,   7
   Apples                     1 APR.,   8       31 MAY ,   8       1 SEP.,   8       1 OCT.,   8
   Apples                     1 APR.,   9       31 MAY ,   9       1 SEP.,   9       1 OCT.,   9
   Apples                     1 APR.,  10       31 MAY ,  10       1 SEP.,  10       1 OCT.,  10
   Apples                     1 APR.,  11       31 MAY ,  11       1 SEP.,  11       1 OCT.,  11
   Apples                     1 APR.,  12       31 MAY ,  12       1 SEP.,  12       1 OCT.,  12
   Apples                     1 APR.,  13       31 MAY ,  13       1 SEP.,  13       1 OCT.,  13
   Apples                     1 APR.,  14       31 MAY ,  14       1 SEP.,  14       1 OCT.,  14
   Apples                     1 APR.,  15       31 MAY ,  15       1 SEP.,  15       1 OCT.,  15
   Apples                     1 APR.,  16       31 MAY ,  16       1 SEP.,  16       1 OCT.,  16
   Apples                     1 APR.,  17       31 MAY ,  17       1 SEP.,  17       1 OCT.,  17
   Apples                     1 APR.,  18       31 MAY ,  18       1 SEP.,  18       1 OCT.,  18
   Apples                     1 APR.,  19       31 MAY ,  19       1 SEP.,  19       1 OCT.,  19
   Apples                     1 APR.,  20       31 MAY ,  20       1 SEP.,  20       1 OCT.,  20
   Apples                     1 APR.,  21       31 MAY ,  21       1 SEP.,  21       1 OCT.,  21
   Apples                     1 APR.,  22       31 MAY ,  22       1 SEP.,  22       1 OCT.,  22
   Apples                     1 APR.,  23       31 MAY ,  23       1 SEP.,  23       1 OCT.,  23
   Apples                     1 APR.,  24       31 MAY ,  24       1 SEP.,  24       1 OCT.,  24
   Apples                     1 APR.,  25       31 MAY ,  25       1 SEP.,  25       1 OCT.,  25
   Apples                     1 APR.,  26       31 MAY ,  26       1 SEP.,  26       1 OCT.,  26
   Apples                     1 APR.,  27       31 MAY ,  27       1 SEP.,  27       1 OCT.,  27
   Apples                     1 APR.,  28       31 MAY ,  28       1 SEP.,  28       1 OCT.,  28
   Apples                     1 APR.,  29       31 MAY ,  29       1 SEP.,  29       1 OCT.,  29
   Apples                     1 APR.,  30       31 MAY ,  30       1 SEP.,  30       1 OCT.,  30
   Apples                     1 APR.,  31       31 MAY ,  31       1 SEP.,  31       1 OCT.,  31
   Apples                     1 APR.,  32       31 MAY ,  32       1 SEP.,  32       1 OCT.,  32
   Apples                     1 APR.,  33       31 MAY ,  33       1 SEP.,  33       1 OCT.,  33
   Apples                     1 APR.,  34       31 MAY ,  34       1 SEP.,  34       1 OCT.,  34
   Apples                     1 APR.,  35       31 MAY ,  35       1 SEP.,  35       1 OCT.,  35
   Apples                     1 APR.,  36       31 MAY ,  36       1 SEP.,  36       1 OCT.,  36
   Apples                     1 APR.,  37       31 MAY ,  37       1 SEP.,  37       1 OCT.,  37
   Apples                     1 APR.,  38       31 MAY ,  38       1 SEP.,  38       1 OCT.,  38
   Apples                     1 APR.,  39       31 MAY ,  39       1 SEP.,  39       1 OCT.,  39
   Apples                     1 APR.,  40       31 MAY ,  40       1 SEP.,  40       1 OCT.,  40
   Apples                     1 APR.,  41       31 MAY ,  41       1 SEP.,  41       1 OCT.,  41
   Apples                     1 APR.,  42       31 MAY ,  42       1 SEP.,  42       1 OCT.,  42
   Apples                     1 APR.,  43       31 MAY ,  43       1 SEP.,  43       1 OCT.,  43
   Apples                     1 APR.,  44       31 MAY ,  44       1 SEP.,  44       1 OCT.,  44
   Apples                     1 APR.,  45       31 MAY ,  45       1 SEP.,  45       1 OCT.,  45
   Apples                     1 APR.,  46       31 MAY ,  46       1 SEP.,  46       1 OCT.,  46
   Apples                     1 APR.,  47       31 MAY ,  47       1 SEP.,  47       1 OCT.,  47
   Apples                     1 APR.,  48       31 MAY ,  48       1 SEP.,  48       1 OCT.,  48
   Apples                     1 APR.,  49       31 MAY ,  49       1 SEP.,  49       1 OCT.,  49
   Apples                     1 APR.,  50       31 MAY ,  50       1 SEP.,  50       1 OCT.,  50
   Apples                     1 APR.,  51       31 MAY ,  51       1 SEP.,  51       1 OCT.,  51
   Apples                     1 APR.,  52       31 MAY ,  52       1 SEP.,  52       1 OCT.,  52
```

Apples	1 APR., 53	31 MAY , 53	1 SEP., 53	1 OCT., 53
Apples	1 APR., 54	31 MAY , 54	1 SEP., 54	1 OCT., 54
Apples	1 APR., 55	31 MAY , 55	1 SEP., 55	1 OCT., 55
Apples	1 APR., 56	31 MAY , 56	1 SEP., 56	1 OCT., 56
Apples	1 APR., 57	31 MAY , 57	1 SEP., 57	1 OCT., 57
Apples	1 APR., 58	31 MAY , 58	1 SEP., 58	1 OCT., 58
Apples	1 APR., 59	31 MAY , 59	1 SEP., 59	1 OCT., 59
Apples	1 APR., 60	31 MAY , 60	1 SEP., 60	1 OCT., 60
Apples	1 APR., 61	31 MAY , 61	1 SEP., 61	1 OCT., 61
Apples	1 APR., 62	31 MAY , 62	1 SEP., 62	1 OCT., 62
Apples	1 APR., 63	31 MAY , 63	1 SEP., 63	1 OCT., 63
Apples	1 APR., 64	31 MAY , 64	1 SEP., 64	1 OCT., 64
Apples	1 APR., 65	31 MAY , 65	1 SEP., 65	1 OCT., 65
Apples	1 APR., 66	31 MAY , 66	1 SEP., 66	1 OCT., 66
Apples	1 APR., 67	31 MAY , 67	1 SEP., 67	1 OCT., 67
Apples	1 APR., 68	31 MAY , 68	1 SEP., 68	1 OCT., 68
Apples	1 APR., 69	31 MAY , 69	1 SEP., 69	1 OCT., 69
Apples	1 APR., 70	31 MAY , 70	1 SEP., 70	1 OCT., 70
Apples	1 APR., 71	31 MAY , 71	1 SEP., 71	1 OCT., 71
Apples	1 APR., 72	31 MAY , 72	1 SEP., 72	1 OCT., 72
Apples	1 APR., 73	31 MAY , 73	1 SEP., 73	1 OCT., 73
Apples	1 APR., 74	31 MAY , 74	1 SEP., 74	1 OCT., 74
Apples	1 APR., 75	31 MAY , 75	1 SEP., 75	1 OCT., 75
Apples	1 APR., 76	31 MAY , 76	1 SEP., 76	1 OCT., 76
Apples	1 APR., 77	31 MAY , 77	1 SEP., 77	1 OCT., 77
Apples	1 APR., 78	31 MAY , 78	1 SEP., 78	1 OCT., 78
Apples	1 APR., 79	31 MAY , 79	1 SEP., 79	1 OCT., 79
Apples	1 APR., 80	31 MAY , 80	1 SEP., 80	1 OCT., 80
Apples	1 APR., 81	31 MAY , 81	1 SEP., 81	1 OCT., 81
Apples	1 APR., 82	31 MAY , 82	1 SEP., 82	1 OCT., 82
Apples	1 APR., 83	31 MAY , 83	1 SEP., 83	1 OCT., 83
Apples	1 APR., 84	31 MAY , 84	1 SEP., 84	1 OCT., 84
Apples	1 APR., 85	31 MAY , 85	1 SEP., 85	1 OCT., 85
Apples	1 APR., 86	31 MAY , 86	1 SEP., 86	1 OCT., 86
Apples	1 APR., 87	31 MAY , 87	1 SEP., 87	1 OCT., 87
Apples	1 APR., 88	31 MAY , 88	1 SEP., 88	1 OCT., 88
Apples	1 APR., 89	31 MAY , 89	1 SEP., 89	1 OCT., 89
Apples	1 APR., 90	31 MAY , 90	1 SEP., 90	1 OCT., 90
Apples	1 APR., 91	31 MAY , 91	1 SEP., 91	1 OCT., 91
Apples	1 APR., 92	31 MAY , 92	1 SEP., 92	1 OCT., 92
Apples	1 APR., 93	31 MAY , 93	1 SEP., 93	1 OCT., 93
Apples	1 APR., 94	31 MAY , 94	1 SEP., 94	1 OCT., 94
Apples	1 APR., 95	31 MAY , 95	1 SEP., 95	1 OCT., 95
Apples	1 APR., 96	31 MAY , 96	1 SEP., 96	1 OCT., 96
Apples	1 APR., 97	31 MAY , 97	1 SEP., 97	1 OCT., 97
Apples	1 APR., 98	31 MAY , 98	1 SEP., 98	1 OCT., 98
Apples	1 APR., 99	31 MAY , 99	1 SEP., 99	1 OCT., 99
Apples	1 APR., 100	31 MAY , 100	1 SEP., 100	1 OCT., 100
Apples	1 APR., 101	31 MAY , 101	1 SEP., 101	1 OCT., 101
Apples	1 APR., 102	31 MAY , 102	1 SEP., 102	1 OCT., 102
Apples	1 APR., 103	31 MAY , 103	1 SEP., 103	1 OCT., 103
Apples	1 APR., 104	31 MAY , 104	1 SEP., 104	1 OCT., 104
Apples	1 APR., 105	31 MAY , 105	1 SEP., 105	1 OCT., 105
Apples	1 APR., 106	31 MAY , 106	1 SEP., 106	1 OCT., 106
Apples	1 APR., 107	31 MAY , 107	1 SEP., 107	1 OCT., 107
Apples	1 APR., 108	31 MAY , 108	1 SEP., 108	1 OCT., 108
Apples	1 APR., 109	31 MAY , 109	1 SEP., 109	1 OCT., 109
Apples	1 APR., 110	31 MAY , 110	1 SEP., 110	1 OCT., 110
Apples	1 APR., 111	31 MAY , 111	1 SEP., 111	1 OCT., 111
Apples	1 APR., 112	31 MAY , 112	1 SEP., 112	1 OCT., 112
Apples	1 APR., 113	31 MAY , 113	1 SEP., 113	1 OCT., 113
Apples	1 APR., 114	31 MAY , 114	1 SEP., 114	1 OCT., 114
Apples	1 APR., 115	31 MAY , 115	1 SEP., 115	1 OCT., 115
Apples	1 APR., 116	31 MAY , 116	1 SEP., 116	1 OCT., 116
Apples	1 APR., 117	31 MAY , 117	1 SEP., 117	1 OCT., 117
Apples	1 APR., 118	31 MAY , 118	1 SEP., 118	1 OCT., 118
Apples	1 APR., 119	31 MAY , 119	1 SEP., 119	1 OCT., 119
Apples	1 APR., 120	31 MAY , 120	1 SEP., 120	1 OCT., 120

MECHANICAL TREATMENTS

NO DATE DEPTH[CM]

*** PARAMETERS OF ACTIVE SUBSTANCE (Propiconazole)***
****

APPLICATION DATE	PESTICIDE APPLIED [KG/HA]	UPPER INCORP. DEPTH [CM]	LOWER INCORP. DEPTH [CM]	FFIELD [-]
2 APR., 1	0.2500	0.0000	0.0000	0.0000

```
 9 APR.,  1   0.2500   0.0000   0.0000   0.0000
16 APR.,  1   0.2500   0.0000   0.0000   0.0000
 2 APR.,  2   0.2500   0.0000   0.0000   0.0000
 9 APR.,  2   0.2500   0.0000   0.0000   0.0000
16 APR.,  2   0.2500   0.0000   0.0000   0.0000
 2 APR.,  3   0.2500   0.0000   0.0000   0.0000
 9 APR.,  3   0.2500   0.0000   0.0000   0.0000
16 APR.,  3   0.2500   0.0000   0.0000   0.0000
 2 APR.,  4   0.2500   0.0000   0.0000   0.0000
 9 APR.,  4   0.2500   0.0000   0.0000   0.0000
16 APR.,  4   0.2500   0.0000   0.0000   0.0000
 2 APR.,  5   0.2500   0.0000   0.0000   0.0000
 9 APR.,  5   0.2500   0.0000   0.0000   0.0000
16 APR.,  5   0.2500   0.0000   0.0000   0.0000
 2 APR.,  6   0.2500   0.0000   0.0000   0.0000
 9 APR.,  6   0.2500   0.0000   0.0000   0.0000
16 APR.,  6   0.2500   0.0000   0.0000   0.0000
 2 APR.,  7   0.2500   0.0000   0.0000   0.0000
 9 APR.,  7   0.2500   0.0000   0.0000   0.0000
16 APR.,  7   0.2500   0.0000   0.0000   0.0000
 2 APR.,  8   0.2500   0.0000   0.0000   0.0000
 9 APR.,  8   0.2500   0.0000   0.0000   0.0000
16 APR.,  8   0.2500   0.0000   0.0000   0.0000
 2 APR.,  9   0.2500   0.0000   0.0000   0.0000
 9 APR.,  9   0.2500   0.0000   0.0000   0.0000
16 APR.,  9   0.2500   0.0000   0.0000   0.0000
 2 APR., 10   0.2500   0.0000   0.0000   0.0000
 9 APR., 10   0.2500   0.0000   0.0000   0.0000
16 APR., 10   0.2500   0.0000   0.0000   0.0000
 2 APR., 11   0.2500   0.0000   0.0000   0.0000
 9 APR., 11   0.2500   0.0000   0.0000   0.0000
16 APR., 11   0.2500   0.0000   0.0000   0.0000
 2 APR., 12   0.2500   0.0000   0.0000   0.0000
 9 APR., 12   0.2500   0.0000   0.0000   0.0000
16 APR., 12   0.2500   0.0000   0.0000   0.0000
 2 APR., 13   0.2500   0.0000   0.0000   0.0000
 9 APR., 13   0.2500   0.0000   0.0000   0.0000
16 APR., 13   0.2500   0.0000   0.0000   0.0000
 2 APR., 14   0.2500   0.0000   0.0000   0.0000
 9 APR., 14   0.2500   0.0000   0.0000   0.0000
16 APR., 14   0.2500   0.0000   0.0000   0.0000
 2 APR., 15   0.2500   0.0000   0.0000   0.0000
 9 APR., 15   0.2500   0.0000   0.0000   0.0000
16 APR., 15   0.2500   0.0000   0.0000   0.0000
 2 APR., 16   0.2500   0.0000   0.0000   0.0000
 9 APR., 16   0.2500   0.0000   0.0000   0.0000
16 APR., 16   0.2500   0.0000   0.0000   0.0000
 2 APR., 17   0.2500   0.0000   0.0000   0.0000
 9 APR., 17   0.2500   0.0000   0.0000   0.0000
16 APR., 17   0.2500   0.0000   0.0000   0.0000
 2 APR., 18   0.2500   0.0000   0.0000   0.0000
 9 APR., 18   0.2500   0.0000   0.0000   0.0000
16 APR., 18   0.2500   0.0000   0.0000   0.0000
 2 APR., 19   0.2500   0.0000   0.0000   0.0000
 9 APR., 19   0.2500   0.0000   0.0000   0.0000
16 APR., 19   0.2500   0.0000   0.0000   0.0000
 2 APR., 20   0.2500   0.0000   0.0000   0.0000
 9 APR., 20   0.2500   0.0000   0.0000   0.0000
16 APR., 20   0.2500   0.0000   0.0000   0.0000
 2 APR., 21   0.2500   0.0000   0.0000   0.0000
 9 APR., 21   0.2500   0.0000   0.0000   0.0000
16 APR., 21   0.2500   0.0000   0.0000   0.0000
 2 APR., 22   0.2500   0.0000   0.0000   0.0000
 9 APR., 22   0.2500   0.0000   0.0000   0.0000
16 APR., 22   0.2500   0.0000   0.0000   0.0000
 2 APR., 23   0.2500   0.0000   0.0000   0.0000
 9 APR., 23   0.2500   0.0000   0.0000   0.0000
16 APR., 23   0.2500   0.0000   0.0000   0.0000
 2 APR., 24   0.2500   0.0000   0.0000   0.0000
 9 APR., 24   0.2500   0.0000   0.0000   0.0000
16 APR., 24   0.2500   0.0000   0.0000   0.0000
 2 APR., 25   0.2500   0.0000   0.0000   0.0000
 9 APR., 25   0.2500   0.0000   0.0000   0.0000
16 APR., 25   0.2500   0.0000   0.0000   0.0000
 2 APR., 26   0.2500   0.0000   0.0000   0.0000
 9 APR., 26   0.2500   0.0000   0.0000   0.0000
16 APR., 26   0.2500   0.0000   0.0000   0.0000


PLANT PESTICIDE PARAMETERS
--------------------------
CROP INTERCEPTION:       1
(1=SOIL(NO), 2=LINEAR, 3=EXPONENTIAL, 4=MANUAL)

    VOLATILIZATION PARAMETERS ACTIVE SUBSTANCE
    --------------------------------------
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```
      TEMPERATURE [deg C]                         20.00
      HENRY-CONSTANT [Pa*m3/mole] or [J/mole]         0.0000
      CALCULATED USING
      VAPOUR PRESSURE [Pa]                        0.0000
      MOLECULAR MASS [g/mole]                        351.0
      WATER SOLUBILITY [mg/l]                       150.0
      ------------------------------------
      TEMPERATURE [deg C]                         30.00
      HENRY-CONSTANT [Pa*m3/mole] or [J/mole]         0.0000
      CALCULATED USING
      VAPOUR PRESSURE [Pa]                        0.0000
      MOLECULAR MASS [g/mole]                        351.0
      WATER SOLUBILITY [mg/l]                       300.0
      ------------------------------------
      Q10-Factor for Henry's constant:                1.000

      DIFFUSION COEFF.AIR [cm2/d]                  4303.
      DEPTH OF SURFACE LAYER FOR VOLATILIZATION [CM]   0.1000
      HENRY CONSTANT AT  20.0 deg C [-]             0.0000
      HENRY CONSTANT AT  30.0 deg C [-]             0.0000


   PLANT UPTAKE OF ACTIVE SUBSTANCE
   --------------------------------
      PLANT UPTAKE FACTOR (-)                       0.0000


  TRANSFORMATION PARAMETERS
  -------------------------

      DegT50 of the compound (d) at 20 °C at pF 2:      82.90

      TRANSFORM.   TRANSFORM.      TEMP.     Q10    MOISTURE-DURING-STUDY   MOISTURE  REL. TRANSFORM    FORMATION
         TO     in EQ.Domaine   OF STUDY    VALUE    ABSOLUTE   RELATIVE    EXPONENT  IN NEQ DOMAIN      FACTOR
                [/DAY]          [C]       [-]       [%]        [%]       [-]          [-]          [-]
       BR/CO2      0.8361E-02       20.00     2.580     0.0000      100.0      0.7000      0.0000       1.000


  SORPTION PARAMETERS
  -------------------

   --PARAMETERS TO CALCULATE KD-VALUES WITH KOC--
      KOC [CM**3/G]                                  835.0
      FREUNDLICH-SORPTION EXPONENT 1/n                          0.8600
      [PEARL] FACTOR DESCRIBING NON-EQ-SITES EQ-SITES (-):         0.0000
      [PEARL] DESORPTION RATE [1/D]:                          0.0000

      MIN. CONC FOR FREUNDLICH-SORPTION [æG/L]                  0.1000E-19
      ESTIMATED MOISTURE FOR AIR DRIED SOIL(m3/m3):              0.2530E-01
      RESULTING REL. CHANGE OF SORPTION COEFF. (-):              100.0


  DEPTH DEPENDEND SORPTION AND TRANSFORMATION PARAMETERS
  ------------------------------------------------------

      HORIZON   KOC       KD       FR-EXP      TRANSFORMATION RATE TO
                                             BR/CO2
          [CM**3/G]  [CM**3/G]     [-]     [/DAY]
       1        835.0    11.61     0.8600     0.8361E-02
       2        835.0    7.766     0.8600     0.4181E-02
       3        835.0    5.845     0.8600     0.4181E-02
       4        835.0    2.505     0.8600     0.2508E-02
       5        835.0    2.505     0.8600     0.0000
       6        835.0    2.255     0.8600     0.0000
       7        835.0    1.754     0.8600     0.0000
(C
Ver 4 Châteaudun

Ver 4 Châteaudun, apples




GENERAL SOIL INFORMATION
------------------------

CORE DEPTH [CM]                              260.0
TOTAL HORIZONS IN CORE                                 7
TOTAL COMPARTMENTS IN CORE                          52
DPFLAG FLAG               (0=DISP.COEFF.1=DISP.LENGTH)  1
THETA FLAG               (0=INPUT,1=PRZM 2=PELMO)      0
PARTITION COEFFICIENT FLAG (0=INPUT,1=CALCULATED)        1
BULK DENSITY FLAG         (0=INPUT,1=CALCULATED)        0
SOIL HYDRAULICS MODULE                              free drainage
COMPARTMENT DEPTH FLAG (0=const,1=depth dep.)            0
```

SOIL HORIZON INFORMATION

HORIZON	THICKNESS [CM]	BULK DENSITY [G/CM**3]	INITIAL SOIL WATER CONTENT [CM/CM]	DRAINAGE PARAMETER [/DAY]	FIELD CAPACITY WATER CONTENT [CM/CM]	WILTING POINT WATER CONTENT [CM/CM]	DISPERSION LENGTH [CM]	ORGANIC CARBON [%]	BIODEG. FACTOR [-]	PH [-]
1	25.0000	1.3000	0.3740	0.1970	0.3740	0.2530	5.0000	1.3900	1.0000	8.0000
2	25.0000	1.4100	0.3720	0.1950	0.3720	0.2350	5.0000	0.9300	0.5000	8.1000
3	10.0000	1.4100	0.3720	0.2130	0.3720	0.2350	5.0000	0.7000	0.5000	8.2000
4	40.0000	1.3700	0.3860	0.2650	0.3860	0.1850	5.0000	0.3000	0.3000	8.5000
5	20.0000	1.3700	0.3860	0.2650	0.3860	0.1850	5.0000	0.3000	0.0000	8.5000
6	70.0000	1.4100	0.4170	0.2960	0.4170	0.1160	5.0000	0.2700	0.0000	8.5000
7	70.0000	1.4900	0.3620	0.2050	0.3620	0.1760	5.0000	0.2100	0.0000	8.3000

OUTPUT FILE PARAMETERS

OUTPUT	TIME STEP	LAYER FREQ
WATR	YEAR	1
PEST	YEAR	1
CONC	YEAR	1

Total number of layers in the top meter: 21

PLOT FILE INFORMATION

NUMBER OF PLOTTING VARIABLES 15

TIMSER NAME	MODE	DEPTH(CM)	ARGUMENT	CONSTANT	SUBSTANCE
LEAC	TSER	100.	21	0.1000E+10	MET A1
PFLX	TSER	100.	21	0.1000E+06	MET A1
INFL	TSER	100.	22	1.000	PESTIC
RUNF	TSER	0.	1	1.000	PESTIC
THET	TSER	0.	1	1.000	PESTIC
THET	TSER	30.	7	1.000	PESTIC
TEMP	TSER	0.	1	1.000	PESTIC
TEMP	TSER	30.	7	1.000	PESTIC
TPAP	TSER	0.	1	0.1000E+06	PESTIC
TDKF	TSER	0.	1	0.1000E+06	PESTIC
TUPF	TSER	0.	1	0.1000E+06	PESTIC
TPST	TSER	5.	2	0.1000E+07	PESTIC
PFLX	TSER	100.	21	0.1000E+06	PESTIC
RFLX	TSER	0.	1	0.1000E+06	PESTIC
LEAC	TSER	100.	21	0.1000E+10	PESTIC

FOCUS Summary Output File

Model Version: FOCUSPELMO 6.6.4
Date of this simulation: 13-Aug-2024 21:10:10
Pesticide input file: Prop_App_E
Simulated crop: Apples

PECgw for ACTIVE SUBSTANCE (Propiconazole)

Location	Selected Period	Flux (g/ha)	Percolate (L/m²)	Conc. (µg/L)
Châteaudun (C)	(18/17)	5.87E-16	325.300	0.000
Hamburg (H)	(17/16)	1.63E-10	325.830	0.000
Jokioinen (J)	(4/5)	0.00E+00	529.600	0.000
Kremsmünster (K)	(16/15)	1.52E-18	245.790	0.000
Okehampton (N)	(17/16)	4.54E-11	913.300	0.000
Piacenza (P)	(8/12)	6.18E-07	1231.40	0.000
Porto (O)	(15/18)	1.78E-12	795.200	0.000
Sevilla (S)	(4/5)	0.00E+00	318.400	0.000
Thiva (T)	(4/5)	0.00E+00	350.600	0.000