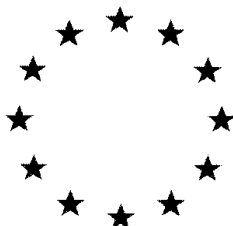


European Commission



VOLUME 3 – Annex B (PPP)

Laminarin

B.8 Environmental fate and behaviour

Rapporteur Member State: The Netherlands

April 2016

**Draft Re-Assessment Report and Proposed decision of the Netherlands
prepared in the context of the possible renewal of laminarin under Regulation
(EC) 1107/2009**

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B.10 Fate and behaviour in the environment (CP 9)

Laminarin is a polysaccharide which leads to smaller-sized oligosaccharides and monosaccharides (glucose) after degradation. No other relevant metabolites, degradation or reaction products are expected to appear (Review Report for the active substance laminarin, SANCO/10488/04-rev.3, 04/10/2004). It is anticipated that the fate and environmental behaviour of the active substance is not influenced by the formulation. Therefore, no product specific studies are shown in the present Document. In table CP 9-1 data available that are considered in the environmental exposure assessment for laminarin, are summarized.

Table B.10-1: Physical and chemical properties of Laminarin

	Laminarin ⁽¹⁾
Molecular formula	(C ₆ H ₁₀ O ₅) _n with n = 20 to 30
Molecular mass	3240-4860 g/mol
Vapour pressure (Pa)	< 2.6 * 10 ⁻⁵ (25°C)
Henry's law constant (Pa.m ³ .mole ⁻¹)	< 3.45 * 10 ⁻⁷ (23-25°C)
Solubility in water	301.5 g/L at 23°C
Solubility in organic solvents (mg/L expressed as glucose)	At about 20 °C
n-heptane	< 10
xylene	< 10
1,2 dichloroethane	< 10
methanol	60
acetone	21
ethylacetate	< 10
Partition co-efficient (log P _{ow})	log P _{ow} = -1.6 (20°C)
Dissociation constant, pKa	No dissociation in water

⁽¹⁾ Review report, document SANCO/10488/04-rev.3, 04/10/2004

B.10.1. Fate and behaviour in soil (CP 9.1)**B.10.1.1. Rate of degradation in soil (CP 9.1.1)****CP 9.1.1.1 Laboratory studies**

No study on the rate of degradation of the product in soil is available. With reference to point CA 7.1.2 In the point CA 7.2.2.1, a study demonstrates that Laminarin is readily biodegradable. In the Technical

Guidance Document on Risk Assessment¹, it is expected that a substance readily biodegradable has a DT₅₀ in soil of 30 days.

CP 9.1.1.2 Field studies

No data, not required.

CP 9.1.1.2.1 Soil dissipation studies

No data, not required.

CP 9.1.1.2.2 Soil accumulation studies

No data, not required.

B.10.1.2. Mobility in soil (CP 9.1.1)

CP 9.1.2.1 Laboratory studies

No data, not required.

CP 9.1.2.2 Lysimeter studies

No data, not required.

CP 9.1.2.3 Field leaching studies

No data, not required.

B.10.1.3. Predicted environmental concentrations in soil (PEC_s) (CP 9.1.3)

Vacciplant Fruits et Légumes is a SL formulation containing 45 g/L Laminarin intended for use as an elicitor of the crop's self defence mechanisms on apples, pear, vine, lettuce, strawberry, tomato, zucchini, pumpkins, aubergine, pepper, greenbean, cucumber and kiwi.

Table B.10.1.3-1: GAP for Vacciplant Fruits et Légumes

Use / crop	Number of applications	Max. Application rate (g a.s./ha)	Interval between application (day)	Foliar Interception (%)*	Max application rate (g a.s./ha)	Application crop stage
Apple	20	45	7	50-80	20*22.5	BBCH 11-89
	7	33.8	10	65-80	7*11.83	BBCH 56-89
Pear	7	33.8	10	65-80	7*11.83	BBCH 56-89
Vine	10	90	10	40-70	10*54	BBCH 11-89
Lettuce	16	113	7	25-70	16*84.75	BBCH 13-49
	7	135	7	25-70	7*101.25	BBCH 16-49
Strawberry	7	45	7	30-60	7*31.5	BBCH 12-92

¹ Technical Guidance Document on Risk Assessment, Part II, European Chemicals Bureau, 2003

	7	90	5-7	30-60	7*63	BBCH 12-92
Tomato	7	90	7	50-80	7*45	BBCH 10-89
		135		50-80	7*67.5	BBCH 10-89
Zucchini	6	33.8	5	50-80	6*16.9	BBCH 10-89
	7	135	7	80	7*27	BBCH 60-89
Pumpkins	6	33.8	5	50-80	6*16.9	BBCH 10-89
Aubergine, pepper	7	135	7	80	7*27	BBCH 60-89
Greenbean	7	135	7	85	7*20.25	BBCH 51-89
Cucumber	7	135	7	80	7*27	BBCH 60-89
	7	135	7	80	7*27	BBCH 51-89
Kiwi	7	90	10	40-85	7*54	BBCH 11-95

*according to guidance document "FOCUS groundwater scenarios in the EU review of active substances, Sanco/321/2000 rev.2"²

Initial, short and long-term actual and time weighted average predicted concentrations in soil ($PEC_{S,act}$ and $PEC_{S,twa}$) are calculated for Laminarin.

The calculation of predicted concentrations in soil (PEC_S) was conducted based on the assumptions regarding degradation for the active substance (see Point B.8.1.1).

Parameters for the estimation of expected concentrations in soil are summarised in Table B.10.1.3-2.

Table B.10.1.3-2: Parameters for the estimation of expected concentrations in soil

Use / crop	Max. number of applications	Max. application rate (g a.s./ha)	Minimal Interval between application (day)	Worst-case foliar interception* (%)	Rate reaching the soil (g a.s./ha)
Apples	20	45	7	50	20*22.5
	7	33.8	10	65	7*11.8
Pear	7	33.8	10	65	7*11.8
Vine	10	90	10	40	10*54.0
Lettuce	16	113	7	25	16*84.8
	7	135	7	25	7*101
Strawberry	7	45	7	30	7*31.5
	7	90	5	30	7*63.0
Tomato	7	90	7	50	7*45.0
		135		50	7*67.5
Zucchini	6	33.8	5	50	6*16.9

² FOCUS groundwater scenarios in the EU review of active substances. Report of the FOCUS Groundwater Scenarios Workgroup. EC Document Reference Sanco.321/2000 rev.2, November 2000

	7	135	7	80	7*27
Pumpkins	6	33.8	5	50	6*16.9
Aubergine, pepper	7	135	7	80	7*27.0
Greenbean	7	135	7	85	7*20.3
Cucumber	7	135	7	80	7*27.0
Kiwi	7	90	10	40	7*54

*according to guidance document "FOCUS groundwater scenarios in the EU review of active substances, Sanco/321/2000 rev.2"³

The initial PEC_{soil} was calculated assuming that the total amounts of the active substance reaching the soil surface per season are homogeneously distributed in the top 5 cm of soil. The subsequent degradation of active substance was assumed to follow simple 1st order kinetics as generally used for modelling purposes.

The initial PEC_{soil} after first application is calculated according to the following formula:

$$PEC_{soil,i,1} \text{ (mg a.s./kg soil)} = \frac{\text{application rate (g/ha)} \times (100 - \text{interception by foliage})}{500 \text{ (m}^3 \text{ of soil)} \times 1.5 \times 100}$$

Assuming first order kinetics, the initial $PEC_{i,n}$ after several applications were calculated according to the following formula:

$$PEC_{soil,i,n} \text{ (mg a.s./kg soil)} = PEC_{soil,i,1} \frac{(1 - e^{-nki})}{(1 - e^{-ki})}$$

where:

$PEC_{soil,i,1}$ = concentration after one application

$PEC_{soil,i,n}$ = initial concentration after n applications,

$k = \ln 2 / DT_{50}$,

n = number of applications.

i = interval between applications in days.

Assuming first order kinetics, the calculated actual concentration ($PEC_{soil,t}$) and the time weighted average concentration ($PEC_{soil,twa}$) for the respective time interval from first application onwards ($PEC_{soil,twa}$) are calculated.

The $PEC_{soil,t}$ is calculated according to formula:

$$PEC_{soil,t} = PEC_{soil,i,n} \times e^{-t \cdot \ln 2 / DT_{50}}$$

The $PEC_{soil,twa}$ is calculated according to formula:

³ FOCUS groundwater scenarios in the EU review of active substances. Report of the FOCUS Groundwater Scenarios Workgroup. EC Document Reference Sanco.321/2000 rev.2, November 2000

$$PEC_{\text{soil, twa}} = PEC_{\text{soil, i, n}} \times \frac{DT_{50}}{t \times \ln 2} (1 - e^{-t \cdot \ln 2 / DT_{50}})$$

where:

$PEC_{\text{soil, t}}$ = concentration at time t ,

$PEC_{\text{soil, i, n}}$ = initial concentration after n applications,

$PEC_{\text{soil, twa}}$ = time weighted average concentration for the time interval t ,

DT_{50} = half-life of dissipation (maximum laboratory or field DT_{50}), in days,

t = considered time period, in days.

The initial PECs values are summarised in Table B.10.1.3-3.

Table B.10.1.3-3: Summary of initial PEC_s of Laminarin following application of Vacciplant Fruits et Légumes

Uses / Crop	Number of applications	Interval between applications [days]	Maximum use rate [g a.s./ha]	Worst-case foliar interception* [%]	Effective soil exposure rate [g a.s./ha]	$PEC_{\text{soil, ini, n}}$ [mg a.s./kg]
Apples	20	7	45	50	20*22.5	0.193
	7	10	33.8	65	7*11.83	0.0613
Pear	7	10	33.8	65	7*11.83	0.0613
Vine	10	10	90	40	10*54	0.314
Lettuce	16	7	113	25	16*84.75	0.700
	7	7	135	25	7*101.25	0.613
Strawberry	7	7	45	30	7*31.5	0.191
	7	5-7	90	30	7*63	0.427
Tomato	7	7	90	50	7*45	0.272
			135	50	7*67.5	0.408
Zucchini	6	5	33.8	50	6*16.9	0.103
	7	7	135	80	7*27	0.163
Pumpkins	6	5	33.8	50	6*16.9	0.103
Aubergine, pepper	7	7	135	80	7*27	0.163
Greenbean	7	7	135	85	7*20.25	0.123
Cucumber	7	7	135	80	7*27	0.163
Kiwi	7	10	90	40	7*54	0.280

*according to guidance document "FOCUS groundwater scenarios in the EU review of active substances, Sanco/321/2000 rev.2"⁴, the worst-case is for the minimal interception.

⁴ FOCUS groundwater scenarios in the EU review of active substances. Report of the FOCUS Groundwater Scenarios Workgroup. EC Document Reference Sanco.321/2000 rev.2, November 2000

Only the short and long term PECs values (1-100 days after last application) for the worst-case initial PEC value is summarised in Table B.10.1.3-4. This scenario is Lettuce with a $PEC_{soil,ini,n}$ of 0.700 mg/kg soil (16 applications at 113 g a.s./ha).

Table B.10.1.3-4: Predicted Environmental Concentration of Laminarin soil after 16 applications of Vacciplant Fruits et Légumes to lettuce (PEC_s)

Days from last application or TWA period	$PEC_{Soil,t}$ (mg/kg)	$PEC_{Soil,twa}$ (mg/kg)
0	0.700	-
1	0.684	0.692
2	0.668	0.684
4	0.638	0.668
7	0.595	0.646
14	0.506	0.598
21	0.431	0.554
28	0.366	0.515
42	0.265	0.448
100	0.0694	0.273

B.10.2. Fate and Behaviour in Water and Sediment (CP 9.2)

B.10.2.1. Aerobic mineralisation in surface water (CP 9.2.1)

B.10.2.2. Water/sediment studies (CP 9.2.2)

No water sediment studies on the product were submitted in the dossier. A study demonstrates that Laminarin is readily biodegradable (CA 7.2.2.1). It is expected that Laminarin (which is stable in sterile water) will be relatively stable in this non-sterile water, but will be readily degraded by the micro-organisms. Therefore no study has been conducted as the outcome would only depend on the equilibrium between the water phase and the solid phase.

In the Technical Guidance Document on Risk Assessment⁵, it is expected that for a substance readily biodegradable a DT_{50} in water of 15 days can be used as default.

B.10.2.3. Estimation of concentrations in groundwater (CP 9.2.4)

Calculation of concentrations in groundwater

Worst case FOCUS calculations for exposure to groundwater would use a Koc of 0 as no data on the sorption of laminarin to soil were submitted in the dossier. This parameter is very conservative and seems not realistic for such organic molecule with a high molar mass like Laminarin. Therefore, the

⁵ Technical Guidance Document on Risk Assessment, Part II, European Chemicals Bureau, 2003

calculation of laminarin concentrations in groundwater with a Koc of 0 is not pertinent, as agreed in the Review Report (SANCO 10488/04-rev.3, 04/10/2004).

Moreover, Laminarin is hydrolytically stable in sterile water at pH 4, 7 and 9, photostable and, readily biodegradable (56-64% biodegradation at day 9-12; 76% biodegradation at day 28).

Due to the ready biodegradability of Laminarin and to its sensitivity to the attack from many bacteria strains in soil giving raise to glucose as transformation product, the chance that Laminarin will ever reach the ground water level can be considered very low. Consequently, no concern is expected for the groundwater.

B.10.2.4. Predicted environmental concentrations in surface water and sediment (PEC_{SW}, PEC_{SD}) (CP 9.2.5)

The estimation of concentrations of Laminarin in surface water and sediment is calculated with FOCUS SW model (FOCUS Steps 1 and 2). The following report presents Predicted Environmental Concentrations (PECs) in surface water and in sediment from losses for Laminarin based on the intended uses as an elicitor of the crop's self defence mechanisms on cereals, orchards, vines, leafy vegetables and fruiting vegetables.

Reference No.:	KCP 9.2.5/01
Report:	Rousseau C. and Grimaldi A. (2015) Laminarin: Computer simulation with FOCUS SW Step 1 and Step 2 for PEC calculation in surface water and sediment according to FOCUS Scenarios for elicitor of the crop's self defence mechanisms applications on cereals, orchards, vines, leafy vegetables and fruiting vegetables. Report No.14/33
Guidelines:	FOCUS (2001 and 2012): 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 final 245 pp. - 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. v1.1 March 2012
GLP:	Not relevant

Previous evaluation:	Submitted for the purpose of renewal
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The report presents the Predicted Environmental Concentrations (PECs) in surface water and in sediment from losses by drift/drainage and drift/run-off for Laminarin based formulations on the intended uses as an elicitor of the crop's self defence mechanisms on orchards, vines, leafy vegetables and fruiting vegetables.

For the assessment, FOCUS surface water scenarios were used considering all input data for Step 1 and Step 2. The PEC_{sw} via drift and run-off/drainage were calculated using the models "Steps 1-2 in FOCUS".

FOCUS SW Step 1

At Step 1 inputs of spray drift, run-off, erosion and/or drainage are evaluated as a single loading (sum of individual applications) to the water body and "worst-case" concentrations are calculated. Run-off corresponds to 10% of applied rate.

FOCUS SW Step 2

At Step 2, loadings are refined as a series of individual applications, each resulting in drift to the water body, followed by a run-off/erosion/drainage event occurring four days after the last application and based upon the region of use (Northern or Southern Europe), season of application, and the crop interception. Therefore, run-off and drainage are not clearly separated at this step.

The following crops and rates were used in the simulations:

Table B.10.2.5-01: Crops and uses of Vacciplant FL

Use / crop	Number of applications	Max. Application rate (g a.s./ha)	Interval between application (day)	Application crop stage
Orchards	20	45	7	BBCH 11-89
Vines	10	90	10	BBCH 11-95
Vegetables, leafy	7	135	7	BBCH 16-49
Vegetables, fruiting	7	135	7	BBCH 10-89

According to FOCUS (2001 and 2012), in case of multiple applications of a compound with the maximum PEC occurring at a day of application, the exposure calculation with Steps 1-2 should be repeated for a single application and the maximum PEC, so the worst case, should be selected for the aquatic risk assessment.

PARAMETERS

The entry parameters for Laminarin were as follows:

Table B.10.2.5-02: Input parameters for Laminarin

Parameter	Value	Reference
General		
Name	Laminarin	-
Formula	$(C_6H_{10}O_5)_n$ with $n = 20$ to 30	-
Water solubility	301.5 g/L at 23°C	Review report, 2004
Sorption		

Parameter	Value	Reference
K _{OC}	0	Worst-case value in absence of data
Transformation		
Soil DT ₅₀	30 d at 20°C	As Laminarin is readily biodegradable and according to Technical Guidance Document on Risk Assessment, Part II, European Chemicals Bureau, 2003
Water DT ₅₀ Steps 1 – 2	15 d at 20°C	As Laminarin is readily biodegradable and according to Technical Guidance Document on Risk Assessment, Part II, European Chemicals Bureau, 2003
Sediment DT ₅₀	1000 d at 20°C	Worst-case
Total system DT ₅₀ Steps 1 – 2	15 d at 20°C	As Laminarin is readily biodegradable and according to Technical Guidance Document on Risk Assessment, Part II, European Chemicals Bureau, 2003

The application parameters for Laminarin were as follows:

Table B.10.2.5-03: Application parameters

Parameters	Steps 1-2			
	Orchards		Vines	
Scenario				
FOCUS crop	Pome / stone fruit early appl.	Pome / stone fruit late appl.	Vines early appl.	Vines late appl.
Intended application stage	BBCH 11-89	BBCH 11-89	BBCH 11-89	BBCH 11-89
Number of applications	20 applications	20 applications	10 applications	10 applications
Interval between applications	7	7	10	10
Application rate	45 g a.s./ha	45 g a.s./ha	90 g a.s./ha	90 g a.s./ha
Crop interception	Minimal crop cover	Average crop cover	Minimal crop cover	Average crop cover
Application window*	March – May June – Sept	March – May June – Sept	March – May June – Sept	March – May June – Sept

* Considering the wide safety-margin in the aquatic risk assessment, it was not considered useful to perform further calculations for the October – February time period.

Parameters	Steps 1-2	
Scenario	Leafy vegetables	Fruiting vegetables
FOCUS crop	Vegetables, leafy	Vegetables, fruiting
Intended application stage	BBCH 16-49	BBCH 10-89
Number of applications	7	7
Interval between applications	7	7

Application rate	135 g a.s./ha	135 g a.s./ha
Crop interception	Minimal crop cover	Minimal crop cover
Application window	March – May June – Sept Oct – Feb	March – May June – Sept Oct – Feb

The maximum initial PECs for Laminarin in the surface water and in the sediment, calculated with FOCUS Step 1 - Step 2, are presented below.

Table B.10.2.5-04: Maximum initial PEC_{sw}; orchards – 20*45 g a.s./ha - 7-d interval

Corres-ponding FOCUS scenario	Application window	Crop interception	Region	Step 1 1 global application		Step 2	
				PEC _{sw} (µg/L)	PEC _{sed} (µg/kg)	PEC _{sw} (µg/L)	PEC _{sed} (µg/kg)
Pome / stone fruit Early application	March – May	Minimal crop cover	N Europe	388	0.00	24.1 (5.83)	0.00 (0.00)
			S Europe			38.2 (8.02)	0.00 (0.00)
	June – Sept	Minimal crop cover	N Europe			24.1 (5.83)	0.00 (0.00)
			S Europe			31.1 (6.92)	0.00 (0.00)
Pome / stone fruit Late application	March – May	Average crop cover	N Europe	347	0.00	14.5 (3.60)	0.00 (0.00)
			S Europe			25.0 (5.24)	0.00 (0.00)
	June – Sept	Average crop cover	N Europe			14.5 (3.60)	0.00 (0.00)
			S Europe			19.7 (4.42)	0.00 (0.00)

(number in brackets refer to respective single application)

Table B.10.2.5-05: Maximum initial PEC_{sw}; vines - 10*90 g a.s./ha - 10-d interval

Corres-ponding FOCUS scenario	Application window	Crop interception	Region	Step 1 1 global application		Step 2	
				PEC _{sw} (µg/L)	PEC _{sed} (µg/kg)	PEC _{sw} (µg/L)	PEC _{sed} (µg/kg)
Vines Early	March – May	Minimal crop cover	N Europe	308	0.00	15.8 (3.96)	0.00 (0.00)

	June – Sept	Minimal crop cover	S Europe			30.2 (7.24)	0.00 (0.00)
			N Europe			15.8 (3.96)	0.00 (0.00)
			S Europe			23.0 (5.60)	0.00 (0.00)
Vines Late application	March – May	Average crop cover	N Europe	324	0.00	16.1 (4.74)	0.00 (0.00)
			S Europe			28.0 (7.47)	0.00 (0.00)
	June – Sept	Average crop cover	N Europe			16.1 (4.74)	0.00 (0.00)
			S Europe			22.0 (6.10)	0.00 (0.00)

(number in brackets refer to respective single application)

Table B.10.2.5-06: Maximum initial PEC_{sw}; leafy vegetables - 7*135 g a.s./ha - 7-d interval

Corres- ponding FOCUS scenario	Application window	Crop interception	Region	Step 1 1 global application		Step 2	
				PEC _{sw} (µg/L)	PEC _{sed} (µg/kg)	PEC _{sw} (µg/L)	PEC _{sed} (µg/kg)
Vegetables, leafy	March – May	Minimal crop cover	N Europe	324	0.00	29.8 (7.19)	0.00 (0.00)
			S Europe			57.8 (13.3)	0.00 (0.00)
	June – Sept	Minimal crop cover	N Europe			29.8 (7.19)	0.00 (0.00)
			S Europe			43.8 (10.3)	0.00 (0.00)
	Oct – Feb	Minimal crop cover	N Europe			71.7 (16.4)	0.00 (0.00)
			S Europe			57.8 (13.3)	0.00 (0.00)

(number in brackets refer to respective single application)

Table B.10.2.5-07: Maximum initial PEC_{sw}; fruiting vegetables - 7*135 g a.s./ha - 7-d interval

Corres- ponding FOCUS scenario	Application window	Crop interception	Region	Step 1 1 global application		Step 2	
				PEC _{sw} (µg/L)	PEC _{sed} (µg/kg)	PEC _{sw} (µg/L)	PEC _{sed} (µg/kg)
Vegetables, fruiting	March – May	Minimal crop cover	N Europe	324	0.00	29.8 (7.19)	0.00 (0.00)

			S Europe			57.8 (13.3)	0.00 (0.00)
			N Europe			29.8 (7.19)	0.00 (0.00)
	June – Sept	Minimal crop cover	S Europe			43.8 (10.3)	0.00 (0.00)
	Oct – Feb	Minimal crop cover	N Europe			71.7 (16.4)	0.00 (0.00)
			S Europe			57.8 (13.3)	0.00 (0.00)

(number in brackets refer to respective single application)

RMS comment.

As the use in cereals is not an intended use in the GAP of Vacciplant FL RMS did not take these results into consideration. To ensure clarity in the document these results were dismissed from the study summary.

B.10.3. Fate and Behaviour in Air (CP 9.3)

B.10.3.1. Route and rate of degradation in air and transport via air (CP 9.3.1)

Predicted environmental concentrations from airborne transport

Laminarin has a very low vapour pressure ($< 2.6 \cdot 10^{-5}$ Pa at 25°C) and a very low Henry's law constant ($< 3.45 \cdot 10^{-7}$ Pa.m³.mol⁻¹ at 23-25°C). These values demonstrate that Laminarin has negligible volatility.

Laminarin is therefore not considered to be persistent in air and any residues in the atmosphere are expected to be rapidly degraded.

B.10.4. Estimation of Concentrations for Other Routes of Exposure (CP 9.4)

No other route of exposure are expected.

B.10.5. References relied on

With reference to point CA 7.6 a literature search was carried out.

In the search strategy search terms related to product were included in the first place. In table CP9.5-1 the general search terms are reported.

Table B.10.5-1: Search terms for all sections

Database: PubMed Search restrictions: all fields	Search terms	Number of summary records retrieved
Active substance common and ISO name	1. Laminarin	308
Active substance chemical name (CA)	2. Laminaran	24
Active substance other names or codes	3. H11	308 – not relevant denomination – will not be used further.
CAS No.	4. 9008-22-4	0
Chemical Name (IUPAC)	5. (1→3)-β-D-glucan	514
EC No	6. 232-712-4	0
CIPAC No.:	7. 671	not relevant denomination – will not be used further.
Trade names	8. IODUS 2 9. VACCIPLANT 10. VAXIPLANT	0 1 0 In view of the very low number of matches, the trade names will not be used further.

As reported in the table above hardly any records were retrieved and trade names were not used for section specific search.

Data point	Author(s)	Year	Title Source Company, Report No. GLP or GEP status Published or not	Vertebrate study Y/N	Data Protection Claimed Y/N	Justification if data protection is claimed	Owner
KCP 9.2.5/01	Rousseau C. and Grimaldi A.	2015	Laminarin: Computer simulation with FOCUS SW Step 1 and Step 2 for PEC calculation in surface water and sediment according to FOCUS Scenarios for elicitor of the crop's self defence mechanisms applications on cereals, orchards, vines, leafy vegetables and fruiting vegetables. Report No.14/33 GLP not relevant Unpublished	N	Y	A 10-year data protection period is claimed as this study : - is necessary to estimate environmental fate of the product. - has not been submitted in the past	Laboratoires Goëmar SAS