# CARCADIS

## **Exposure and risk assessment** of contaminants in fertilisers Comparison of exposure tools and establishment of a strategy for meaningful 'screening' assessment

**Deleebeeck Nele, Lefèvre Laura** 

Contact: nele.deleebeeck@arcadis.com

The exposure/risk assessment methodology presented in this poster was the methodology followed in the project "Contaminants in fertilisers\*: Assessment of the risks from their presence and socio-economic impacts of a possible restriction under REACH" performed for the European **Commission, DG Environment.** 

\* Fertilisers as defined by the EU Fertilising Products Regulation (EU 2019/1009)



### Methodology explained

#### Comparison of available exposure assessment tools

#### **EUSES**

(European Union System for the Evaluation of Substances)

Developed for assessment of chemicals and biocides

#### **ECPA-LET**

(European Crop Protection Association - Local **Environment Tool)** 

Developed for assessment of co-formulants in pesticides

Considers direct releases to agricultural soil.

Similar dimensioning and based on similar calculations as the FEE tool, with small differences (e.g. mixing depth of soil, residence time for calculation of surface water concentration, ...)

#### **FEE tool**

#### (Fertilizers Environmental Exposure Tool)

Developed by Fertilizers Europe in cooperation with ARCHE Consulting for assessment of fertiliser constituents

#### Considers **direct releases to agricultural soil.**



Local scenario = 1 ha agricultural field surrounded by 

#### Local scenario

No direct releases to agricultural soil in EUSES  $\times$ 

version 2.1.2. Direct releases to soil included in EUSES 2.2.0, but specifically developed for outdoor applications of biocides, **not relevant** for agricultural fertiliser applications.

Local scenario = point source scenario with direct/ indirect emissions to environmental compartments. 1 and arrival

	around the point source.		shallow water body (2.5 m width, 0.3 m depth, 1000 m <sup>2</sup> surface area).
Regional scenario	<b>Regional PEC can be calculated</b> (based on SimpleBo 4.0 model).	Regional PEC cannot be calculated.	<b>Regional PEC cannot be calculated</b> but needs to be entered as input value.
Environmental fate calculations	REACH R.16 guidance	REACH R.16 guidance, complemented with calculation methods and parameters from FOCUS Step 2 (FOCUS, 2015).	<b>REACH R.16 guidance, complemented with calculation</b> <b>methods and parameters from FOCUS Steps 1-2</b> (FOCUS, 2015) and SimpleBox 4.0 (RIVM, 2015).
	Run-off, drainage and erosion only taken into accoun regional assessment.	t in	
	Drift only included in certain biocide scenarios not applicable to fertilisers.	All relevant processes included (run-off, drainage, drift, erosion)	All relevant processes included (run-off, drainage, drift, erosion).
	Crop offtake not taken into account.	Crop offtake is not taken into account.	Crop offtake can be taken into account.
Secondary poisoning	Included.	Included.	Not included.
Humans exposed via the environment	Included.	Not included.	Not included.
spERCs	spERC settings <b>to be added manually.</b>	<b>2 scenarios</b> (ECPA).	<b>4 scenarios</b> (REACH FARM Consortium).
Refinement options (risk reduction measures)	No options foreseen relevant for agricultural practice	es. Specific risk reduction measures relevant for agricultural practices included (application frequency, crop type and growth stage, soil incorporation, spatio-temporal adjustments).	Specific risk reduction measures relevant for agricultural practices included (application frequency, crop type, growth stage, concentration and yield, soil incorporation, drift and run-off reduction).
Applicability for organics/inorganics	Only applicable to <b>organics</b> – modification needed to adjust calculations for inorganics/metals.	Developed for <b>organics</b> , not specifically adapted for inorganics/metals.	Fully adapted for both <b>organics and inorganics/metals</b> .
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Exposure calculations in different

• FEE tool (based on abovementioned comparison) for calculation of local PEC after 1 and 10 years of application

It should be noted that the views expressed in the poster are those of the contractor with the context of the service contract 070201/2019/817112/SER/ENV.B2 and according to the terms of reference associated with that contract.

#### environmental compartments

Source contribution analysis

the environment

• Regional concentrations (to be added to local concentration) based on median of available monitoring data (IPCHEM, GEMAS, ...)

• Local PEC from FEE tool + EUSES calculations • Experimental BCF and BSAF values used for metals/inorganics and - if available – also for organics

• Due to unavailability of experimentally determined transfer factors to meat and milk for metals/inorganics, mean measured concentrations reported by EFSA or literature are used

• To get an idea of the contribution of assessed fertiliser use to the total concentrations in the environment • Sources considered: other fertiliser types, atmospheric distribution, irrigation water, manure, (digested) sewage sludge, compost, etc.

#### **Contaminants/impurities assessed:** Cd, Cr, V, Hg, F, PFAS, PCDD/F, diclofenac $\rightarrow$ Results of risk assessment for **PFAS** are presented in our other **POSTER\***

Secondary poisoning and humans exposed via

• For **further results** of the risk assessments and results of pre-RMOAs see the project report

\* Deleebeeck N, Lefèvre L (2022). PFAS in recycled fertilisers: Potential issues, identified uncertainties, and need for monitoring. Poster presented at SETAC Europe 32nd Annual Meeting, Copenhagen, Denmark.

#### Acknowledgement

The results presented were generated in view of the project "Contaminants in fertilisers: Assessment of the risks from their presence and socio-economic impacts of a possible restriction under REACH" (European Commission – DG Environment). The project team was composed of Arcadis, DHI, Arcadia International and Vander Straeten Consulting Services. Presented work was performed by Arcadis.

The report can be found here (QR)

