

Soil risk assessment: impact of new tools on the ecotoxicological evaluation of soil organism

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The European soil risk assessment of plant protection products is currently under change. A major revision of the exposure calculation procedure was published by EFSA (2017) including new guidance's and tools for modelling predicted environmental concentrations in soil (PEC_{soil}). The objective of the current study is an impact assessment of these changes on the overall soil risk assessment which is based on two tiers. In the Tier-1 assessment, PEC_{soil} values are compared with regulatory acceptable concentrations (RAC) from laboratory studies with relevant non-target soil organisms. If this reveals the possibility of risks, the relevant uses must be evaluated under natural field conditions (higher tier).

A comprehensive modelling study was carried out for 56 parent substances (plus up to two metabolites) to derive PEC_{soil} values for a wide range of substance properties and application patterns. Details can be found in the accompanying poster by Multsch et al.. The overall impact was investigated on the basis of the risk failure rate which is derived by the quotient of PEC_{soil} and RAC. Results show that the failure rate will highly increase when the new calculation scheme for PEC_{soil} by EFSA is applied in comparison to the current accepted method (FOCUS, 1997). The overall failure rate is significantly higher, increasing from 14% (using FOCUS based PEC_{soil} values) to 67%, 58% and 36% (using Tier-1, Tier-2 and Tier-3A EFSA PEC_{soil} values), which would trigger at least 3 times more higher tier ecotoxicological field studies. Moreover, selection procedures of geographic locations for exposure assessment at Tier-3A result in incompatible soil properties (e.g. organic carbon content, bulk density) between e-fate and ecotoxicological data, hindering scientifically reasonable comparison, interpretation and quantification of the risk.

Overall, an updated ecotoxicological risk assessment guidance for soil organisms is required which addresses the utilization of the new exposure endpoints in a tiered risk approach. The definition of additional 'intermediate-tiers' for exposure and ecotoxicological assessment is an option to overcome the current issues in the overall alignment of risk assessment steps, which in-turn requires a sufficient time period to implement changes by applicants and authorities.

Keywords: soil, risk, predicted environmental concentration, ecotox
