Dealing with uncertainty in pesticide fate model scenarios for pesticide registration.

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One step in the registration procedure of pesticides in the European Union is the demonstration by model simulations that the use of the pesticide does not lead to an exceedance of critical environmental concentrations. These simulations must be carried out for a set of 'worst-case' scenarios. A 'worst-case' scenario is a combination of soil and climate properties within a certain region for which predicted concentrations are higher than a certain percentile of the distribution of concentrations for all climate and soil property combinations within that region. Most often, the 90th percentile is chosen. The application of this definition to derive scenarios is however complicated by a few factors. The first factor is the uncertainty about the soil and pesticide fate parameters that are used in the model. The second factor is the non-linearity of the relation between soil parameters, pesticide fate parameters and predicted environmental concentrations. This implies that the ranking of climate and soil property combinations is different for different pesticide properties. As a consequence, the percentile of the predicted environmental concentration of a certain pesticide using a soil and climate combination or scenario that was derived for other pesticide properties may differ from the intended percentile of the scenario. In this presentation, we present a procedure to quantify the effect of parameter and scenario uncertainty. This procedure is demonstrated for the selection of scenarios that predict pesticide concentrations in the top soil. These concentrations are the basis for the evaluation of ecotoxicological effects of pesticides in soils.