An assessment of environmental and toxicological risk to pesticide exposure based on a case-based approach to computing

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Abstract. Pesticide environmental fate and toxicity depends on its physical and chemical features, the soil composition, soil adsorption, as well as residues that may be found in different soil slots. Indeed, pesticide degradation in soil may be influenced by either biotic or abiotic factors. In addition, the toxicity of pesticides for living organisms depends on their adsorption, distribution, biotransformation, dissemination of metabolites together with interaction with cellular macromolecules and excretion. Biotransformation may result in the formation of less toxic and/or more toxic metabolites, while other processes determine the balance between toxic and a nontoxic upcoming. Aggregate exposure and risk assessment involve multiple pathways and routes, including the potential for pesticide residues in food and drinking water, in addition to residues from pesticide use in residential and non-occupational environments. Therefore, this work will focus on the development of a decision support system to assess the environmental and toxicological risk to pesticide exposure, built on top of a *Logic Programming* approach to *Knowledge Representation and Reasoning,* complemented with a *Case Based* attitude to computing. The proposed solution is unique in itself, once it caters for the explicit treatment of incomplete, unknown, or even self-contradictory information, either in terms of a qualitative or quantitative setting.