

## **Developing a new operator exposure model for plant protection products within the EU BROWSE project**

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### **Abstract**

BROWSE (Bystanders, Residents, Operators and WorkerS Exposure models for plant protection products) is a European 7<sup>th</sup> Framework Program 3-year project ([www.browseproject.eu](http://www.browseproject.eu)) which started on 1 January 2011. Work Package 1 of this project is the development of a single, new and improved modelling framework for operator exposure, integrating all available exposure data in order to replace the diversity of different models (e.g. UK POEM, German BBA model, etc.) currently used in the regulatory framework for Plant Protection Products (PPPs). The operator is considered as a person carrying out tasks such as mixing and loading, application, cleaning etc. These tasks may all be done by the same or different individuals, depending on the type of farm enterprise.

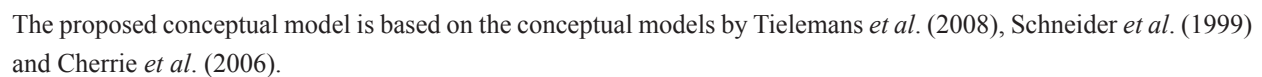
The development of the operator model will take explicit account of key factors and mechanisms influencing exposure during a range of PPP application scenarios across EU Member States (MS) and will be superior to existing models, which are based on simple algorithms and surrogate exposure values, by using probabilistic modeling approaches. In order to do this a conceptual model (shown in Fig. 1) was developed in 2011 taking into account the important routes of exposure for the operator, namely via the dermal, respiratory, and oral route. The dermal exposure route is further subdivided into three main routes in which dermal exposure can occur, i.e. through bulk (i.e. splashes during mixing/ loading), via deposition (i.e. from spray drift) and via surfaces (i.e. transfer from contaminated surfaces such as crops or equipment).

The conceptual model applies a source-to-receptor based approach and consists of several compartments with principle modifying factors and underlying determinants of exposure. An example of a compartment in the conceptual model is the source. One of the principle modifying factors of the source is the 'substance emission potential' with underlying determinants such as the volatility of a substance. The conceptual model differentiates between exposure in the near field and the far field of the operator.

During 2012 this conceptual model approach will be worked out for the key PPP application scenarios, starting with downward hydraulic boom spraying and the mixing/loading of liquid PPP formulations. For these two scenarios the most important exposure determinants will be identified and exposure profiles will be determined based on available exposure data and information on key exposure determinants like application equipment used, application rate, duration, risk management measures (like cabins) and personal protective equipment.

New information on the key PPP application scenarios and the behavior of operators will be collected in surveys due to be carried out in the UK, Italy and Greece. This information is required as currently farm survey data across EU MS are very limited, and do not provide detailed

Proposed conceptual model:	Note: Only the most relevant routes & mass transfers are indicated. If a compartment is not relevant (e.g. clothing), it then automatically continues to the next compartment (skin)
Compartments & transfer for inhalation, dermal & ingestion routes	



## Acknowledgement

## References

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