

Scientific opinion about TKTD models to assess risks of time-variable exposure for pesticides in edge-of-field surface waters

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In 2018, the Panel on Plant Protection Products and their Residues (PPR) of the European Food Safety Authority (EFSA) published a scientific opinion (SO) on the state of the art of Toxicokinetic/Toxicodynamic (TKTD) models in regulatory risk assessment of pesticides for aquatic organisms (*EFSA PPR, 2018. EFSA Journal 2018;16(8):5377*). This SO gives an overview and evaluates the state of science of existing TKTD models for lethal and sublethal effects on animals and primary producers. It is concluded that GUTS models (General Unified Threshold models of Survival), which account for lethal effects on animals, are well established and can be used in the risk assessment scheme to assess the risk of time-variable exposure. DEBtox models (Dynamic Energy Budget toxicity models) account for sublethal effects of pesticides on growth and reproduction. They are considered to be in an advanced state but not yet ready to be used for regulatory risk assessment; the SO provides some suggestions for improving them and making them more suitable for this purpose. Models accounting for the effects of pesticides on primary producers have been also evaluated. Currently, species-specific models have been developed for *Lemna sp.*, *Myriophyllum sp.*, and two algae species. A conclusion about the state of science for these species-specific models suggests that the *Lemna* model is suitable for use in regulatory risk assessment, given that some remaining aspects of model applications such as better documentation of optimisation methods and sensitivity analyses are improved, while some shortcomings prevented to recommend the *Myriophyllum* and algae models as fit for purpose. The poster gives an overview about the principles of these different TKTD models and summarises the conclusions presented in the SO.