



Identifying priority zones in an agricultural catchment to mitigate glyphosate runoff

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Pesticide concentrations in rivers generally have a very dynamic signature and are strongly dependent on time and space. The dynamic time course is due to the time- and space-variant input conditions resulting from fast overland (runoff and erosion, direct losses) and subsurface flow (artificial drainage), directly connecting surfaces and/or agricultural fields where pesticides are applied, to receiving rivers. A thorough understanding of pesticide behavior at the watershed scale is needed to increase the effectiveness of mitigation measures. We developed a method to derive priority zones for applying mitigation measures for erosion control and mitigation of glyphosate runoff in an agricultural catchment. The study catchment was selected based on results from geospatial pesticide emission modeling, historical glyphosate concentrations, and crop cover. Priority zones were derived based on a risk map which includes information about the topography, crop cover, the estimated glyphosate use, the potential erosion risk, and the connectivity of the agricultural parcels to the river. The theoretical risk map was then validated in the field using field observations of runoff during stormflow events, and observations of roads short-circuiting the runoff to the river. The validated risk map was used to define priority zones for measures related to erosion control. Suggestions for specific measures such as grass buffer strips and small dams at the field scale were made. The information will be used to target farmers that may have a significant impact on the glyphosate load to surface water. Those farmers will be encouraged to participate in a voluntary erosion control program supported by the local government. The effect of mitigation measures on the glyphosate concentrations in the river will be assessed by monitoring two years before and three years after implementation of the measures. We will present the general setup of the study and the selection methodology of the priority zones in the catchment.