

## **The achievement of good chemical status: an impossible mission for local water managers?**

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The European Water Framework Directive (2000) required to achieve good ecological and chemical status in surface waters of the EU Member States in 2015. For pesticides, this means ensuring that concentrations in rivers do not exceed  $0.1 \mu\text{g/L}$  per molecule and  $0.5 \mu\text{g/L}$  for the sum of the concentrations of the different molecules found. At national scale, EcoPhyto plan (2008) aimed to reduce pesticide use by 50% within 10. This plan has been revised and postponed to 2025 as observed pesticide use is varying between years and concentrations in river did not decrease as expected.

Although vineyards cover a small percentage of agricultural land surfaces, they contribute to 20% of national pesticide use. The presence of pesticides in rivers surrounding wine territories is therefore a current environmental concern. Thus, the recovery of the water quality requires local action programs to reduce pesticide contamination in rivers.

The Layon catchment comprises 13% of vineyard. It is therefore subject to an action program led by the local water committee: the SAGE Layon-Aubance-Louet. Its goal is to ensure pesticide concentrations are reduced to  $1 \mu\text{g/L}$  in 2018 and  $0.5 \mu\text{g/L}$  in 2027. In this context, one of the actions of the SAGE, with the assistance of the University of Angers, addresses the study of peaks in pesticide concentrations during runoff events in a small catchment covered by vineyards. Between 2009 and 2016, one of the two farmers has converted to organic farming with consequent decreases in pesticides input to the case study which thus complied with the EcoPhyto objectives. Results demonstrate first a peak intensity of pesticides in runoff waters in relation with the date of application with a decrease of concentrations during time after the treatment and second a relation between peaks of SPM and pesticides. Transfer of pesticides in this catchment is strongly linked to runoff. Thus, even if the increase of grass surface within vineyard improves the soil stability and decreases erosion sensitivity, it is not sufficient to stop all transfer of pesticides.

Following the results of this study, neither the objectives of national policies to reduce by half the pesticide use nor the local objectives to decrease partially the un-weeded surface of vineyards would permit to achieve good chemical status, as confirmed by the current state of the water quality of the Layon river monitored by local water managers. Thus, in the continuation of all its efforts, it is up to local water managers to find new local solutions to comply with the Water Framework Directive.