

Caroline Chavinier¹, Valérie Pot¹, Cédric Chaumont², Sylvie Néliu¹, Marjolaine Deschamps¹, Emmanuel Queyla¹, Julien Tournebize², Pierre Benoit¹
¹Université Paris-Saclay, INRAE, AgroParisTech, UMR ECOSYS, 91120 Palaiseau, France,
²Université Paris-Saclay, INRAE, HYCAR, Antony, France
 Email : caroline.chavinier@inrae.fr
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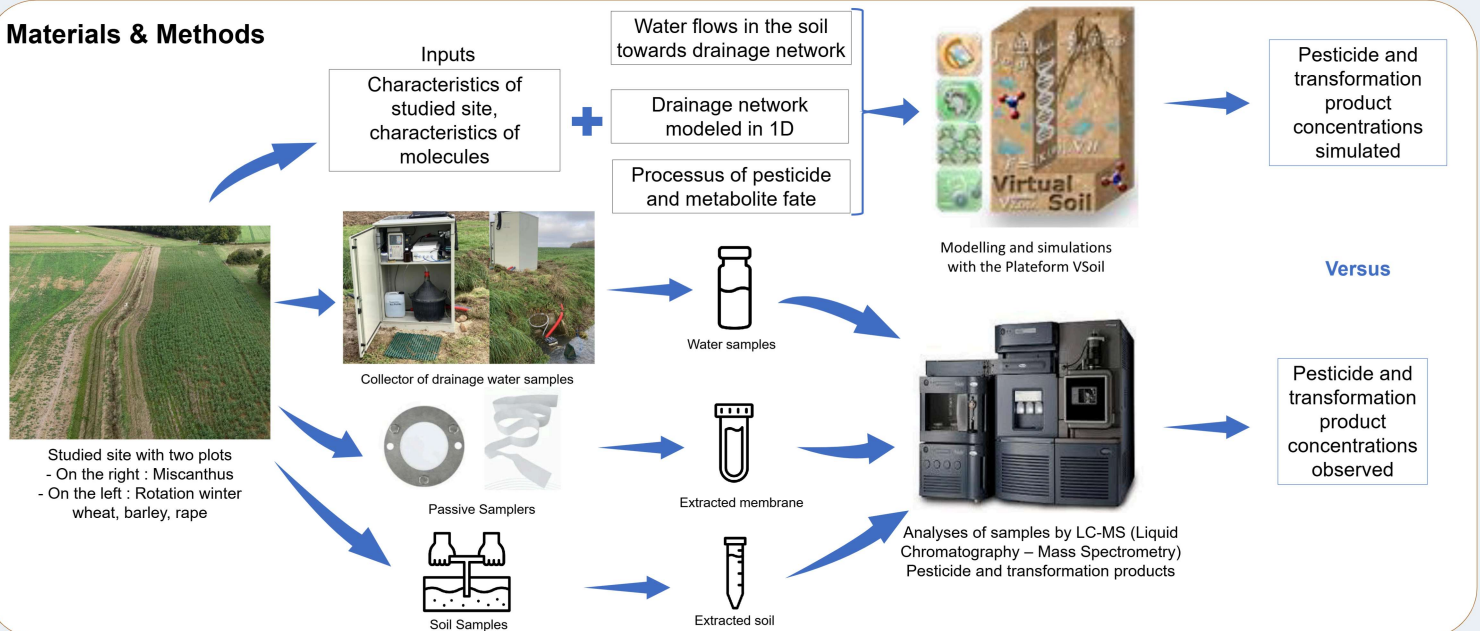
Context. Pesticides are substances mainly used in agriculture to protect crops against pests. Large-scale monitoring studies have found pesticide residues everywhere in the environment, including in areas where they have not been applied (Margoum et al., 2025 ; Geissen et al., 2021 ; Humann-Guillemot et al., 2019 ; Riedo et al., 2022). In this context, various policies have been implemented in Europe. In France, the Ecophyto 2030 Strategy aims to reduce the use of plant protection products by 50% by 2030, compared to the three-year average for 2011-2013 (Ministère de l'Agriculture, de l'Agro-Alimentaire et de la Souveraineté Alimentaire, 2024). To achieve this goal, several solutions exist, such as organic agriculture, integrated farming, or low-input crops. Miscanthus belongs to this category of crops. Generally, it is implanted for 20 to 25 years and requires inputs only in the first and, potentially, the second year after implantation. This crop appears to be a promising option for reducing pesticide presence in vulnerable environments, such as drinking water production areas. However, pesticides or their transformation products can be detected several years after pesticide application. The contamination by transformation products is clearly identified as a major threat to drinking water resources. Therefore, it is necessary to assess in field conditions how this perennial crop can limit pesticide and transformation product concentrations in soils and soil leachates.

Questions and hypothesis

Research questions : Does Miscanthus implantation influence pesticide and transformation product dynamics ? What are the consequences for the drinking water quality ? What are the main processes involved in the fate of pesticide transformation products after Miscanthus implantation ?

Hypothesis : Miscanthus will enable a significant reduction in pesticide and transformation product concentrations in water.

Materials & Methods



Preliminary results

Figure 1. Pesticide concentrations in drainage water samples of studied plots

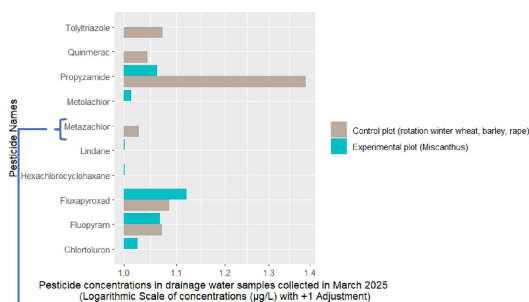
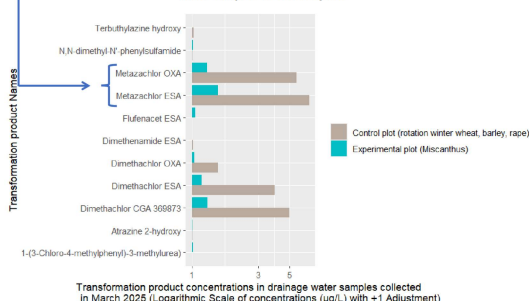


Figure 2. Transformation product concentrations in drainage water samples of studied plots



Result interpretation. According to these first results, some transformation products are present even though their parent compounds are not detected. Regarding pesticides, several of them are detected in the experimental plot and not in control plot. This observation could be explained by the fact that the drainage water samples were collected before the implantation of Miscanthus. Then, the results obtained will serve as a baseline for comparison with data collected during following measuring drainage campaigns, after Miscanthus establishment. Furthermore, data from analyses of water and soil samples collected during following measuring campaigns, will also be aligned with crop management practices.

Perspectives. Based on results obtained from the various field campaigns, the objective will be to improve a modelling tool able to predict contaminations by transformation products. Such a tool will help identifying the major processes involved in the dynamics of soil and water concentrations estimated from water drainage measurements at the plot scale.

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