

Understanding Pesticide Risks to Ecosystems and Human Health: The SPRINT Project

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FIGURE 1

Overview of SPRINT field monitoring.

The SPRINT (Sustainable Plant Protection Transition) project, funded by the EU Horizon 2020 programme, aims to assess the impact of pesticide residues on environmental, animal, and human health. In response to the urgent need for more sustainable agriculture, SPRINT provides robust real-world data to support policy decisions and societal efforts towards reduced pesticide reliance.

Monitoring took place in 11 case study sites – 10 in Europe and 1 in Argentina – covering both conventional and organic systems. Over 4,600 samples were collected from soil, crops, water, sediments, air, indoor dust, earthworms, and biological matrices from humans and animals. More than 200 active substances and metabolites were detected using advanced analytical methods.

Results showed widespread pesticide residues. 97% of soil samples contained residues, often as complex mixtures including banned substances. Surface waters and sediments showed contamination, with herbicides (e.g. glyphosate) and insecticides (e.g. lambda-cyhalothrin) exceeding thresholds. Crops also contained multiple residues, and all indoor dust samples were contaminated – often with insecticides at higher levels than herbicides and fungicides. Organic farms consistently had lower levels and fewer substances.

Biomonitoring results were concerning. Pesticides ranked among the top 20 for health risk were detected in human and animal samples, including known carcinogens, endocrine disruptors, and reproductive toxicants. Concentrations were higher in conventional systems.

Findings reveal significant ecological risks, particularly for aquatic species and earthworms, alongside the presence of persistent and banned substances such as DDT.

Additionally, SPRINT supports the shift towards sustainable agriculture by identifying high-risk compounds, tracing exposure pathways, and promoting effective non-chemical alternatives. It also provides a prioritisation tool to guide risk-based monitoring and inform policy. As such, SPRINT delivers scientific insights that align with the EU's Farm to Fork strategy and contribute to global sustainability goals.

To know more about SPRINT project please visit: <https://sprint-h2020.eu/>

