

Revealing the impact of 70 years of pesticide use on European soils

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Pesticides have been used in European agriculture for more than 70 years, so monitoring their presence, levels and their effects in European

soils quality and services is needed to establish protocols for the use and the approval of new plant protection products.

In an attempt to deal with this issue, a team led by the prof. Dr. Violette Geissen from Wageningen University (Netherlands) have analyzed 340 [soil samples](#) originating from three European countries to compare the content distribution of pesticide cocktails in soils under organic farming practices and soils under conventional practices.

The soil samples were obtained from two case study sites in Spain, one case study site in Portugal, and one case study site in the Netherlands. These covered four of the main European crops: horticultural products and oranges (in Spain), grapes (in Portugal), and potato production (in the Netherlands). Chemical analyses revealed that the total content of pesticides in conventional soils was between 70% and 90% higher than in organic soils, although the latter soils did also contain [pesticide residues](#).

Although in 70% of conventional soils mixtures of up to 16 residues were detected per sample, only a maximum of five different residues were found in the organic soils. the residues most frequently found and in the greatest quantities were the herbicides Glyphosate and Pendimethalin. The samples were collected between 2015-2018, as no major changes occurred in terms of management, there are indicative of current situation, and likely of other Eu [agricultural areas](#)."

Once the presence of these pesticide cocktails in European agricultural soils is unfolded, it becomes necessary to have a greater understanding of the effects that these complex and cumulative mixtures have on soil health, an area in which there is currently a major lack of information.

The research team emphasis the need to define and introduce regulations and reference points on pesticide cocktails in soils in order to protect the

soil's biodiversity, and the quality of crop production. Additionally, taking into account the persistence of residues in organic soils it is necessary to reconsider the time required for the transition from conventional agriculture to organic agriculture, making it dependent on the mix of residues in the [soil](#) at starting point and the time they take to degrade.

More information: Violette Geissen et al, Cocktails of pesticide residues in conventional and organic farming systems in Europe – Legacy of the past and turning point for the future, *Environmental Pollution* (2021). [DOI: 10.1016/j.envpol.2021.116827](https://doi.org/10.1016/j.envpol.2021.116827)

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