

SoildiverAgro project

Adoption of new management practices to increase crop production and quality



THE WHAT AND WHY

European agricultural fields contain a diversity of economically important plant-parasitic nematodes

Research demonstrated that agro-ecological treatments can improve the biodiversity of nematode communities. However, nematode communities usually also contain economically harmful plant-parasitic nematodes (EH-PPN). From 188 soil samples, taken in conventional and organic wheat fields in nine EU-pedoclimatic regions, the presence of some EH-PPN genera was determined. Results revealed that almost all fields contained such PPN. Despite years of research to find ways to battle, even eradicate EH-PPN, they are still very commonly present and poses a threat to both sustainable conventional and organic farming. The genera *Pratylenchus* and *Paratylenchus*

turned out to be most wide-spread. Especially *Pratylenchus* is potentially harmful as these nematodes can induce secondary plant diseases by bacteria and fungi. None of the EU-regions were completely free of a root-knot (*Meloidogyne*) or cyst nematode (*Heterodera* and *Globodera*) infestation. These genera contain EU-quarantine species. Even low numbers can result in severe reduction of crop yield and quality. More EH-PPN genera, including virus-transmitters like *Xiphinema*, *Longidorus* and (*Para*-)*Trichodorus*, could be detected but mostly in lower numbers and less wide-spread.



1. *Pratylenchus penetrans*, a migratory, endo-parasitic, root-lesion nematode species (ILVO).



2. *Xiphinema* sp., a virus transmitting nematode species (ILVO).

HOW IS THE CHALLENGE ADDRESSED

Plant-parasitic nematodes can be controlled by resistant varieties

An healthy soil ecosystem generally can control pests and diseases. However, agricultural fields many times have a degraded biodiversity due to the (intensive) management. It is recommended to keep track of the host status of each crop in the rotation system, especially in more diversified (agro-ecological) cropping systems with cover crops and/or mixed cropping systems. Resistant and preferably also tolerant plant varieties should be favoured in order to control these economically harmful plant-parasites efficiently. To avoid induction of nematode virulence, crop breeding companies should keep on screening for and eventually marketing new resistant and/or tolerant crop varieties.

3. A complex cover crop mixture with a variety of plants each potential hosts for plant-parasitic nematodes (ILVO).



KEYWORDS

Control, host status, resistant varieties, plant-parasitic nematodes, rotation system.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 817819

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