Plant health for sustainable agriculture Conference, 11.-12. Mai 2015, Ljubljana, Slowenien

**Nematode dynamics under minimum tillage**

J. Hallmann1,2, J. Schmidt2, M.R. Finckh2

1Julius Kühn-Institut, Federal Research Centre for Cultivated Plants, Institute for Epidemiology and Pathogen Diagnostics, Toppheideweg 88, 48161 Münster, Germany;

2Kassel University, Ecological Plant Protection, Nordbahnhofstraße 1a, 37213 Witzenhausen, Germany.

E-mail address of corresponding author: *johannes.hallmann@jki.bund.de*

Agriculture has transformed over the past centuries dramatically to become highly dependent on non-renewable fossil fuels, synthetic fertilizers and plant protection agents. This often occurs at the cost of soil degradation and soil food web disturbance. Future agriculture must not only be productive but also provide ecosystem services such as carbon sequestration, pest and disease suppression, nutrient cycling and water storage to become sustainable in the long-term. Sustainability is especially fostered by reduced tillage and the presence of a permanent layer of plant residues. Under such conditions, soil compaction is reduced, soil structure improved, water infiltration enhanced, soil organic content increased and microbial activity stimulated. However, continuous soil cover, especially associated with permanent growth of plants, might also enhance plant-parasitic nematode densities due to permanent food supply. The effect of minimum tillage on nematode dynamics was studied within the EU-funded project “Optimizing subsidiary crop applications in rotations”. The rotation consisted of clover-grass, winter wheat, cover crop, and potato. The following treatments were studied: Plough versus minimum tillage, white clover versus subterranean clover as undersown crops in winter wheat, vetch versus a 1:4 mix of fodder radish and black oats as cover crop following winter wheat, and with and without 5t DM ha-1 compost application. Initially, the field was infested with *Helicotylenchus*, *Meloidogyne*, *Paratylenchus*, *Pratylenchus* and *Tylenchorhynchus*. *Pratylenchus* and *Helicotylenchus* increased under wheat and *Meloidogyne* was supported by white clover and subterranean clover as undersown crops. Population densities of all nematode taxa declined during the following catch crop and potato. There was no difference in nematode population dynamics between plough versus minimum tillage, nor between compost versus no compost. Results will be discussed considering the recent literature.

**Keywords**: sustainable agriculture, nematodes, crop rotation, subsidiary crops

**Acknowledgement**:

The study was supported by the EU 7th Framework programme project OSCAR (289277) (www.oscar-covercrops.eu).