

# SOIL INVERTEBRATES WITHIN ARABLE ROTATIONS

Cover crops can deliver or support a range of ecosystem services that underpin agricultural production. Their prevalence in agricultural landscapes is likely to increase, as farming practice changes to incorporate encouraging biodiversity in our farmed landscapes.

Alongside supporting invertebrate biodiversity, cover cropping can have a significant effect in reducing agricultural run-off and loss of nutrients through minimising soil exposure. Additionally, the use of legumes (e.g. *Trifolium repens* and *Trifolium mixes*) have been shown to support an abundant and rich habitat for arthropods and soil invertebrates as well as providing nitrogen fixation.

## Focus on NIAB research

NIAB is using a long-term rotational trial to quantify invertebrate abundance within arable systems. The New Farming Systems (NFS) rotations study, based at Morley in Norfolk, is a fully replicated trial that started in 2007. Funded by The Morley Agricultural Foundation and the JC Mann Trust, this study into long-term cover crop management approaches specifically explores the use of clover bi-cropping, as well as bio-cultivation and legume-based cover crops.

The NFS study is establishing the relationship between cover cropping, invertebrate populations, and their agronomic impact on crops. With an extensive dataset already in place the work will provide a unique insight to identify and quantify variation in species abundance and distribution associated with intensively managed arable with, or without, the use of rotational cover crops.



Ground dwelling indicator species include wolf spider and lacewing larvae

In 2023, the trial grew winter wheat and allowed baseline measurements for soil invertebrates. Results showed that:

- Earthworm functional groups (anecic, endogeic, epigeic) were not substantially affected by cover cropping or clover bi-cropping;
- The invertebrate groups using Alpha Diversity metrics (a measure of the structure of an ecological community with respect to its richness and abundance) showed no significant difference in the functional diversity between the cover crop management approaches.

Further measurements will continue as part of The Centre For High Carbon Capture Cropping (CHCx3) project, investigating how rotational cover crops could increase soil organic carbon and growing system resilience.

