# NEWSLETTER

May 2026

## WELCOME TO OUR NEWSLETTER

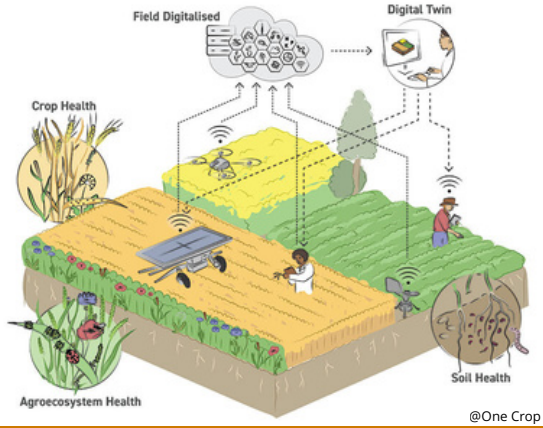
Welcome to the first edition of the One Crop Health quarterly newsletter, where we share updates, insights, and discoveries from our research project that aims at developing the next generation of sustainable crop protection.

In each issue, you can expect updates from across the project in Denmark and the UK.

- The *Farm networks* section will share seasonal highlights, where monitoring platforms, field experiments, and agro-biodiversity surveys generate the on-farm data that underpin our research.
- The *Field Insights* section will report on emerging findings on how cropping practices influence weeds, pests, pathogens, and beneficial organisms across different farming systems.
- Our *PhD Project Digest* will introduce the early-career researchers driving much of the project's discovery, highlighting studies on topics such as weed ecology, disease prediction, and agroecosystem modelling.
- The *Technology Corner* section will showcase innovative tools, from AI-assisted monitoring to sensor networks, being developed to help detect risks earlier and support more precise crop protection.

Welcome to our community and to the journey toward healthier crops, ecosystems, and farming systems!

@group photo of OCH project team




@One Crop Health figure

## ABOUT ONE CROP HEALTH

The One Crop Health: Next Generation Crop Protection is a six-year research project (2024-2029) led by the University of Copenhagen with partners in Denmark (Aarhus University) and the UK (Rothamsted Research and the University of Sheffield). The project is funded by the Novo Nordisk Foundation.

One Crop Health brings together experts across disciplines to develop more sustainable approaches to crop protection.

Inspired by the "One Health" concept, One Crop Health applies a holistic perspective to crop protection, recognizing that crop health depends on interactions between plants, soils, biodiversity, and farming practices.

Through agroecological research, advanced monitoring technologies, and collaborations with farmers in Denmark and the UK, the project aims to reduce pesticide reliance while supporting resilient and productive cropping systems.

A key feature of the project is close collaboration with farmers and large experimental platforms, allowing researchers to study crop health in real farming systems across DK and the UK. Data from these networks will support predictive models and site-specific solutions that balance productivity, biodiversity, and environmental sustainability.

@Experimental fields in Taastrup, Denmark

## THIS SEASON IN OCH

*Louise Johns & Andrea Cavalieri*

This spring, field teams in DK and UK are heading out into the field again to monitor pests, weeds and diseases in winter wheat and oilseed rape fields.

In addition, as we move into this second field season for the One Crop Health project, we have identified three farms in the UK and three farms in Denmark that will be established as pioneer farms. On these farms, we plan to upscale our data collection and sampling efforts, collecting more data on within-field spatial variation in agro-biodiversity.

As part of those efforts, the pioneer farms will support testing and scaling of camera-based systems (tractor-mounted OWLs – see Technology Corner section, drone imagery and a high-resolution "VestCam") for mapping weeds and potentially pests and diseases. We will also place devices in fields for sampling air to assess the potential for measuring disease spore presence, pollen and environmental DNA. Other insect camera traps and methods for assessing the presence and activity of soil mesofauna are also being explored.

PhD students will be actively involved in research on the pioneer farms, supporting data collection, system testing, and analysis while contributing to the scientific development of their studies.

The knowledge and understanding generated will support upscaling of data collection, helping to identify practical approaches for integrating digital tools into monitoring agro-biodiversity. Ultimately, as the project progresses we will explore the integration of state-of-the-art image and DNA-based monitoring across the wider farm networks.

## FIELD INSIGHTS

### INTRODUCING NATIONAL FARM NETWORKS

*Louise Johns & Andrea Cavalieri*

During the 2025/26 growing season, the One Crop Health project established farm monitoring networks in Denmark and the UK to support long-term research on crop and agroecosystem health. Across these networks, large research teams will perform extensive monitoring, sampling and mapping to assess the density, diversity and distribution of insect pests and beneficials, pathogens and weeds.

Ultimately, we aim to integrate this data with annual field management (pesticide use, crop type, tillage system etc.) and environmental (weather, soil type etc.) data to understand what drives pest, weed and disease pressure from farm-to-farm and from year-to-year.

In Denmark, the network includes 46 farms across Sjælland, Fyn, and Jutland. Researchers began building a baseline of the soil weed seedbank by sampling and analysing weed seeds in the soil. Seasonal monitoring visits in spring and summer also assessed the abundance of weeds, pests, and diseases in winter wheat and oilseed rape, helping identify patterns across different regions.

In the UK, 50 commercial farms joined the project in 2025, spanning locations from Wiltshire to Norfolk and Lincolnshire. Similar surveys were conducted to those in Denmark, using identical protocols.

Together, these networks will generate valuable data over the next five years to better understand the factors influencing crop health, biodiversity, agroecosystem health and pesticide use in Denmark and UK. We look forward to providing updates in this Field Insights feature in future issues of this newsletter.

@OCH team visits experimental fields in Taastrup, Denmark

## PHD PROJECT DIGEST

*Bela Fistric & Laurence Still*

Across the One Crop Health project, we have recruited 12 PhD students. Seven based in Denmark at the University of Copenhagen and Aarhus University, and five based in the UK at Rothamsted Research and the University of Sheffield. The PhD students are the “engine room” that develops novel approaches and new insights for One Crop Health. Their research encompasses many aspects of groundbreaking science relating to insect, pathogen and weed biology and monitoring in agroecosystems. Projects encompass insect-weed interactions, soil biology, weed mapping, computer vision and systems modelling.

This highly-motivated cohort of early career researchers have self-organised and formed a PhD committee who is responsible for communicating with the One Crop Health steering group, sharing funding opportunities, organizing PhD activities such as journal club and social coffee mornings, and making sure that all One Crop Health students stay connected to one another.

All of the students started their research at the end of 2025 and will be working alongside the wider One Crop Health team to collect samples, analyse data, and generate novel science and applications that can help to reduce pesticide-reliance in agroecosystems.

In the coming newsletters, we will take a closer look at individual PhD projects. We will introduce the researchers, explain the questions they are working on, and show how their work can help farmers manage weeds, pests, and diseases in more effective and sustainable ways.

@Open Weed Locator

## TECHNOLOGY CORNER

*Guy Coleman & David Comont*

The best time to plant a tree was yesterday. With the rise of agricultural foundation models, there is growing importance placed on collecting real-world agricultural image data at sufficient scale and diversity for training.

For plant detection and analysis, foundation models (e.g. WeedNet) help understand plant characteristics across different crops, soil types, and lighting conditions without requiring large annotated datasets. This reduces the need to manually label thousands of images for each weed species–environment interaction, though these architectures still require millions of diverse images.

This is where the OpenWeedLocator (OWL) complements the One Crop Health (OCH) project, building off the Farm Network. The OWL is an open-source, low-cost Raspberry Pi device in a rugged enclosure. Originally built for real-time weed detection, we are deploying the OWL for scalable data collection. For the 2026 season, devices will be mounted on tractors and farm vehicles across six pioneer farms in the UK and Denmark. The OWLs will capture images under variable lighting, shadows, and the complexity of a working farm, contributing to a growing open-source imagery database.

Access to these datasets de-risks market entry for agtech startups and enables international research focused on Danish and UK farms. We are planting the trees today so the next generation of models have the field-validated data they need tomorrow.

To learn more about the OWL (and build your own), visit this link

ONE CROP HEALTH

## ONE CROP HEALTH GOES ONLINE

We are pleased to launch the new One Crop Health web page, a central hub for information about our activities and collaborations. The page provides an overview of how the One Crop Health approach brings together expertise across disciplines to support resilient cropping systems, sustainable crop protection, and long-term agricultural productivity. It also offers access to the people, research, and practical initiatives that drive the project.

### Home

The Home page introduces the One Crop Health concept and outlines our mission to promote resilient crop production through integrated approaches that connect plant, soil, and environmental health.

### Research areas

The Research Areas section presents the main scientific themes guiding our work and highlights how interdisciplinary research contributes to sustainable crop management.

### Organisation

Under Organisation, the Management Team page describes the leadership and coordination of the initiative, while Meet the Team introduces the broader group of researchers and specialists involved.

### Resources

The Resources section provides insight into the practical platforms that support our research and innovation.

Here, visitors can learn about the Farms Network, which connects farms used for testing and demonstrating crop health approaches, as well as the Pioneer Farms, where farmers and researchers collaborate to develop and test innovative practices.

This section also highlights our Field Experiments, which generates scientific evidence and practical knowledge to support sustainable crop management strategies.

### News

The News section shares updates on projects, events, and new developments within the One Crop Health community.

Follow us here!

**Contact us at:** pbneve@plen.ku.dk