



NEWSLETTER

June 2026

THIS SEASON IN ONE CROP HEALTH

Andrea Cavalieri

As summer continues, the One Crop Health project enters the final phase of its annual monitoring cycle. Starting with the establishment of winter wheat and oilseed rape in autumn, our observations continue through spring and summer to track the changing dynamics of weeds, diseases, pests, and their natural enemies, throughout the growing season and across diverse farms in Denmark and England.

We know that populations of pests, weeds and diseases vary at many scales: within fields, between farms, across regions and between countries. But understanding why these patterns occur is the real challenge. By combining monitoring data across our network of fields, we aim to identify which crop, management and environmental factors drive pest outbreaks and which agroecosystems are naturally more resilient.

Across the season, we have seen how these dynamics change. Weed pressure often declines from autumn into summer as crops develop and management measures take effect, allowing us to explore how weed communities respond under different conditions. Disease development remains closely linked to weather, with temperature, rainfall and humidity influencing infection risk. Continued surveillance helps us understand when and where these risks emerge.



©OSR stems used for larval collection



©One Crop Health figure

©Cabbage stem flea beetle damage in OSR
Photo by S M Ashik-Uz-Zaman

Pest monitoring provides another example of connecting observations across seasons. Cabbage Stem Flea Beetle (CSFB) is monitored from autumn through to harvest, from early shoot-holing damage caused by adult feeding, to spring assessments of larval populations developing within the crop.

As our teams head into the field for the final monitoring round, One Crop Health continues to generate the knowledge needed to understand pest, weed and disease interactions and support more sustainable crop management decisions.

These long-term observations also provide the foundation for more detailed investigations into pathogen biology, biodiversity, and emerging monitoring technologies featured in the following sections.

FIELD INSIGHTS

Louise Johns & Kevin King

Building on the wider seasonal monitoring activities of One Crop Health, the UK field team has been investigating one important oilseed rape disease in greater detail: Phoma stem canker.

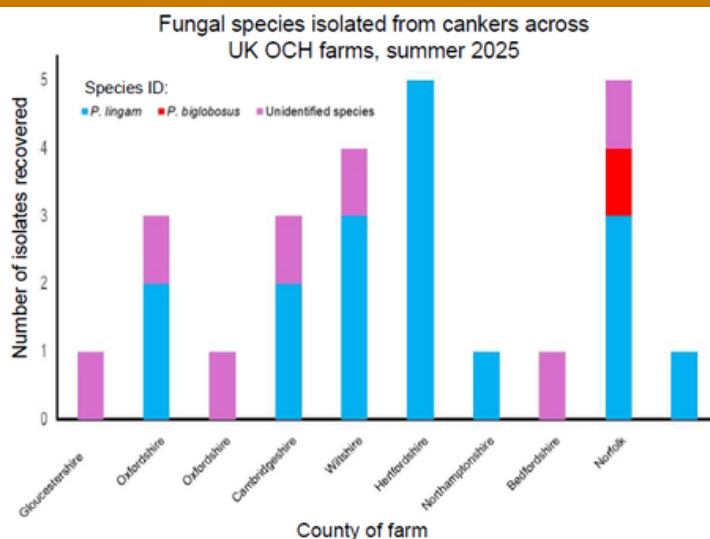
In the UK in 2025, we collected cankered stems. From these, we have been able to culture fungi and identify the species using DNA-based approaches.

Phoma stem canker is caused by two closely related species: *Plenodomus lingam* and *P. biglobosus*. Recent reports have suggested that *P. biglobosus* is becoming an increasingly important pathogen. Interestingly, from our samples, we only identified *P. biglobosus* at a single site in Norfolk, instead finding *P. lingam* to be the much more common species.

Additionally, a third 'mystery' fungal species was also found to be widespread; it will be interesting to analyse the DNA of this fungus and determine whether it is harmless or a canker-causing pathogen.

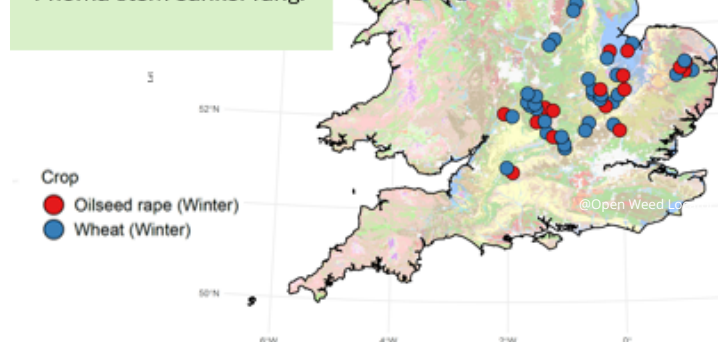
The UK field team are currently sampling cankers from the 2026 farm cohort to expand this work. Dr King hopes to conduct further research using samples from the OCH project. Agronomic factors (fungicides, host resistance genes, climate change etc.) are likely to influence pathogen population structure and will be investigated.

Preliminary results on the sensitivity of UK isolates to key fungicides have already been obtained and are providing new information on emerging resistance threats to UK crops.



In numbers:

- In 2025 we surveyed **50 fields** in the UK:
- **17 OSR** fields (and 33 wheat)
- OSR stem samples taken in summer from **10 farms** across **8 counties**
- Yielded **25 isolates** of Phoma stem canker fungi



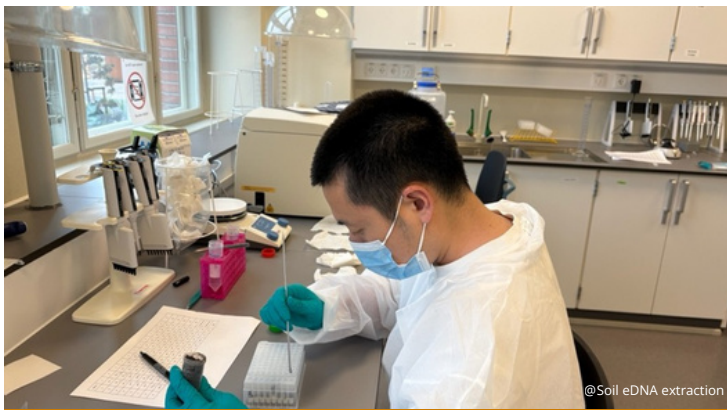
These studies also highlight the growing role of DNA-based methods in crop health surveillance.

Beyond identifying individual pathogens, new molecular tools may help us better understand the wider biodiversity present within agricultural systems, an area explored further in the following PhD project digest.



Phoma stem canker

Phoma isolates on agar plates



@Soil eDNA extraction

PHD PROJECT DIGEST

Harnessing eDNA for surveillance & management of crop health 'pests' and beneficials in agroecosystems

Zhao Li

Sustainable and resilient crop health management requires a better understanding of agricultural biodiversity and how it influences plant health. Many organisms living above and below ground can either suppress pests and diseases or provide valuable ecosystem services such as pollination and natural pest control.

My PhD project explores how environmental DNA (eDNA) can be used to monitor plants, insects, fungi, and microbial communities in agricultural landscapes.

By linking biodiversity data with farm management practices and landscape characteristics, we aim to develop indicators that support the One Crop Health approach and help guide more targeted and sustainable crop management.

Current progress:

Soil eDNA is currently being extracted from samples collected from the Danish farm network in 2024 (P1). These same fields were also surveyed using traditional seedbank experiments, providing a unique opportunity to compare how effectively eDNA detects weed diversity. In parallel, DNA from plants, arthropods, fungi, and bacteria will be analysed and linked with information on crop type and farming practices to help develop biodiversity indicators for healthy agricultural systems.

To improve plant identification from eDNA data, a Danish plant DNA barcode reference library is being established. So far, around 16,000 existing DNA sequences have been compiled, providing strong coverage across three commonly used plant markers.

A low-cost airborne eDNA sampler is currently being tested and adapted for future field campaigns(P2).

Next steps:

After summer, seasonal sampling will begin across selected Danish farms. Soil, leaf-surface, and airborne eDNA samples will be collected to investigate how biodiversity changes across seasons and farming systems.

As the One Crop Health project expands its monitoring capabilities, combining field observations with molecular and sensor-based approaches will help generate increasingly detailed datasets on crop health and biodiversity. This integration of ecological knowledge and technology is already beginning to shape the next generation of monitoring tools.



@Airborne eDNA sampler

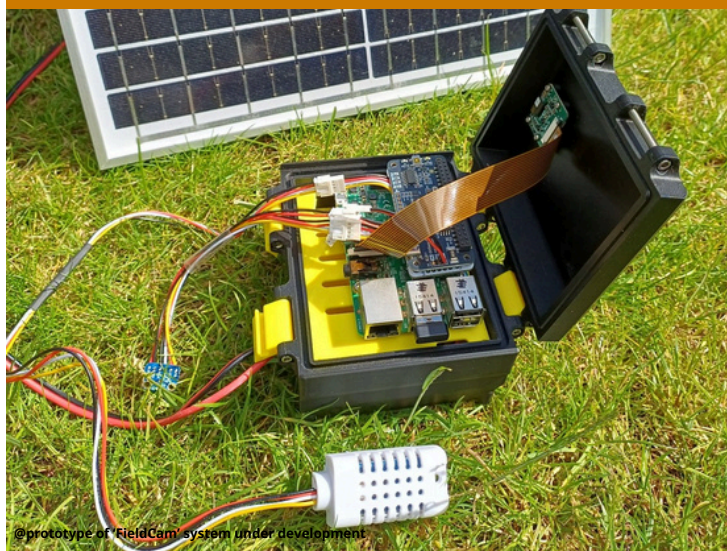
TECHNOLOGY CORNER

Guy Coleman & David Comont

"I can't replace my agronomist, but I can give them hundreds of extra eyes!" This faintly dystopian sentence was used by a grower to describe their adoption of machinery-mounted cameras for weed detection. The inference being that technology is still no match for the skill and experience of a trained person. However, by harnessing the right technology, we can get a clearer picture of what's out there, ensuring the right decisions are made in the right place and at the right time.

In the One Crop Health (OCH) project we have taken this sentiment to heart. Our field surveyors have years of experience in identifying insects, plants, and pathogens, and they are trained in careful sampling methods to accurately measure these organisms. They have worked tirelessly throughout the spring, summer, and autumn to record pest, weed, and disease pressures across our field networks.

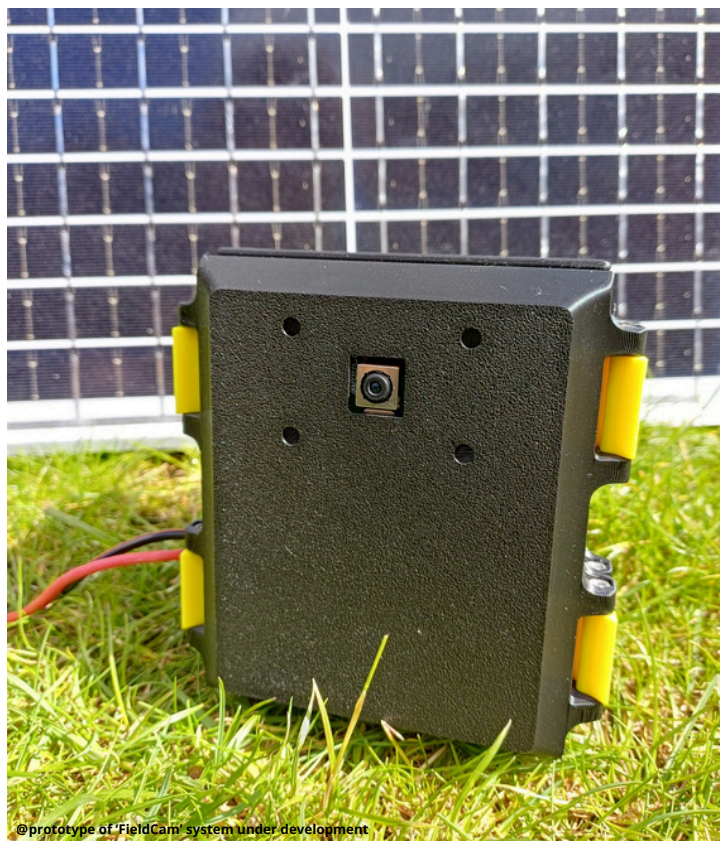
Still, they cannot be everywhere at all times. What could we learn if we monitored fields every day instead of just three times a year? What might we discover if we could monitor at night? Or by using sensors to access data that a human simply cannot detect?



@prototype of 'FieldCam' system under development



@close-up image of pests inside a glasshouse attracted to a yellow sticky trap, captured by the FieldCam



@prototype of 'FieldCam' system under development

These are precisely the types of questions that we are exploring at a small number of designated "pioneer" sites, fields which we are instrumenting with technologies and sensors to scale up our data collection.

Currently in development is 'FieldCam' a small, solar-powered camera system that can be installed in the field and left to monitor for days, weeks, or potentially months. Designed to be as cost-effective and low-powered as possible, the ambition is to provide a flexible way to capture time-series data, such as the rate of crop development, pest accumulation in traps, or weed seed removal and predation. This would help us monitor fields more intensively, extend observation into periods when the field team is unavailable, and capture data that a traditional field team just cannot.

Although still under development, these devices are expected to be deployed in the 2026/27 season. They will be introduced alongside technologies already in place at these pioneer sites, including air-sampling for pathogen spores and the Open Weed Locator camera system for weed detection.

Echoing the earlier sentiment: "We don't want to replace our field surveyors, but through OCH we want to give them the tools and technologies to generate better, more complete datasets on biodiversity and crop protection."



For scientific inspiration and to facilitate discussions across the two projects and relevant stakeholders, we have invited five keynote speakers:

- Cathie Martin (JIC, UK)
- Jonathan Storkey (Rothamsted, UK)
- Chloe Maclaren (SLU, DK)
- Fernando Geu-Flores (UCPH, DK)
- Jon West (Rothamsted, UK).

When: 12 & 13 August 2026

Where: CPSC Auditorium, Bülowsvej 21A, Frederiksberg, Denmark

Want to join us? Register [here!](#)

NEWS

Join us at the Future Agri-Food Systems
NNF Challenge Symposium
12 - 13 Aug 2026

A common theme running throughout the One Crop Health project is the importance of connecting expertise across disciplines, from field monitoring and molecular biology to biodiversity and new technologies. This interdisciplinary approach is also central to the upcoming Future Agri-Food Systems Challenge Programme Symposium.

The symposium brings together two NNF Challenge Grant projects, the [N2CROP](#) and [One Crop Health](#) and aims at bringing new external input and inspiration to the projects, to advertise project results, and to strengthen ties with the plant science and plant breeding communities.

Over the day, there will be short presentations from N2CROP and One Crop Health members, to highlight current research within the two projects, as well as selected talks from submitted abstracts.

HELP SHAPE AI TOOLS THAT WORK FOR YOU



We're developing and assessing an AI tool to help monitor cabbage stem flea beetle and need your help



Takes less than
10 minutes

What do I need to do?



We need you to help estimate cotyledon (seedling) leaf damage with and without guidance.

We will also ask about your opinions towards AI tools like these

Who is this for?



Farmers



Researchers

Please send any questions to Laurence Still:
Laurence.still@rothamsted.ac.uk

SCAN TO
TAKE THE
SURVEY!



SCAN WITH YOUR PHONE
CAMERA TO START