

PROJECT TITLE: Understanding litter decomposition dynamics in UK agroforestry systems: the role of tree rows and soil animals.

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Project keywords: soil, ecology, agriculture, sustainability, decomposition, microarthropods

Proposed start date: 17th June 2024

Project description: Soil degradation on UK farmland has triggered substantial carbon losses, contributing to global climate change and threatening our long-term food security. Development of sustainable farming practices which protect existing soil carbon and promote the underlying processes for its formation is critical to meet targets for climate change and food security. Alley-cropping, the integration of tree rows on to farmland, is a promising strategy to improve soil carbon stocks. However, we still know very little about the processes involved in soil carbon formation within these systems. This project aims to further our understanding of these processes by looking at the first stage of nutrient recycling: decomposition.



Through a **combination of fieldwork, laboratory work, and data analysis**, you will explore how alley-cropping influences the decomposition of above-ground plant litter, and the role of soil animals in this vital process. Over your eight-week placement, you will collect litter bags (buried in November 2023) from five farms across the UK, calculate rates of mass loss for litter bags in the laboratory, and conduct statistical analyses to understand how these

rates have been influenced by the presence and proximity of tree rows. You will also complete physiochemical analyses on soil samples to explain *why* tree rows may have influenced the observed decomposition dynamics. This is an exciting opportunity to develop your fieldwork, laboratory, and critical thinking skills whilst contributing to a wider project which will inform policy development and land-management decisions at a pivotal time for UK agriculture. The work you produce will **directly contribute to a study that will be submitted for publication**.

At the beginning of your placement, you will be able to **attend the Farm Woodland Forum Annual Meeting** and learn more about agroforestry and its role in meeting UK policy targets. During your placement, you will be **fully integrated into the Biodiversity Futures Lab** at The Natural History Museum in London, with the opportunity to **attend research group meetings/ events/ training as well as networking and educational events** (e.g., coffee mornings and seminars) with researchers and staff from across the museum.

Candidate requirements:

- Ability to be at the museum four/five days a week for the first six weeks of the project (for field and lab work) and flexibility with distribution of working hours to accommodate fieldwork days.
- Willingness to travel to fieldwork sites and undertake long days of fieldwork.

Background reading:

(1) <https://doi.org/10.1111/j.1469-185X.2009.00078.x>; (2) <https://doi.org/10.3390/su12177001>

Approximate Work Schedule in weeks (desk based/lab/report writing):

- **WEEK 1** (17th June – 21st June): intros (2 days), fieldwork (1 day), Farm Woodland Forum (2 days)
- **WEEK 2:** fieldwork (2 days) & laboratory work (3 days) – collect and weigh litter bags.
- **WEEKS 3-4:** laboratory work – calculate soil contamination of litter samples.
- **WEEKS 5-6:** laboratory work – physiochemical analysis of soil samples.
- **WEEK 7:** desk-based work – data input and analysis.
- **WEEK 8:** desk-based – create presentation and present work to Biodiversity Futures Lab.