

Discovering Next-Generation Bioherbicides for Oat Production

Project ID: 3547

Supervisory team

Rothamsted supervisor: Dr Dana MacGregor (Rothamsted Research)

Academic supervisor: Dr Neil Brown (University of Bath)

Non-academic (CASE) supervisor: Laura Melling (The Jordans and Ryvita Company; a division of ABF Grain Products Limited)

Other supervisors: Dr Tim Mauchline (Rothamsted Research) & Dr Laura Gonzalez Macia (University of Bath)

Host institution: Rothamsted Research (Registered at University of Bath)

CASE partner: The Jordans and Ryvita Company (a division of ABF Grain Products Limited)

Project description: Can microbes help solve one of agriculture's biggest challenges: weed control? This PhD will investigate whether naturally occurring soil microbes and the bioactive compounds they produce can be developed into sustainable alternatives to conventional weed management. Using unique microbial resources from the UK Crop Microbiome Cryobank, the student will identify microbial strains capable of suppressing blackgrass, the UK's most problematic and economically important weed. To be effective in agricultural systems, candidate microbes must suppress weeds while remaining compatible with the crop. The student will therefore evaluate the effects of microbial strains and their bioactive compounds on oat performance, reflecting the crop's increasing importance within resilient cereal production systems and its central role within the Jordans Cereals supply chain. Working across microbiology, plant science, metabolomics and data science, the student will isolate and characterise promising microbial candidates, investigate the mechanisms through which they suppress blackgrass and evaluate their compatibility for use by oat growers. The project is an exciting opportunity to combine fundamental biological discovery with real-world application and will be undertaken in collaboration with Rothamsted Research, Jordans Cereals and the University of Bath. This fully-funded four-year PhD operates within the SWBio DTP and includes an enhanced stipend and additional research funding from Jordans Cereals. The student will join a collaborative research environment and contribute to the development of sustainable biological solutions and leave prepared for careers across academia and industry. They will receive training in microbial culturing, molecular biology, plant phenotyping, controlled-environment experimentation, 'omics technologies, bioinformatics, and quantitative data analysis. Through involvement with Jordans Cereals, they will have the opportunity to interact with members of the wider agri-food supply chain and gain an understanding of the challenges that transitioning to a sustainable farming system pose. The project leverages the team's extensive research infrastructure, specialist facilities and interdisciplinary expertise, contributing to sustainable weed management strategies and UK farming resilience. It aligns with the growing demand for sustainable farming practices and offers the potential to develop microbial biocontrol products that reduce chemical inputs and safeguard productivity in oat fields, even against herbicide-resistant weeds. We are committed to providing a supportive and inclusive research environment. You will be part of a collaborative team and benefit from tailored mentorship, professional development opportunities, and engagement with both academic and industry partners. Whether your interests lie in plant science, microbiology, or sustainable agriculture, this project provides a strong foundation for a career in research and innovation. Continued on next page.....

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Can Microbes Solve Oat Growers' Weed Problem? Interested? Contact: Dana.MacGregor@Rothamsted.ac.uk				

Our aim as the SWBio DTP is to support students from a range of backgrounds and circumstances. Where needed, we will work with you to take into consideration reasonable project adaptations (for example to support caring responsibilities, disabilities, other significant personal circumstances) as well as flexible working and part-time study requests, to enable greater access to a PhD. All our supervisors support us with this aim, so please feel comfortable in discussing further with the listed PhD project supervisor to see what is feasible.