

FoodBioSystems DTP - PhD Project Advertisement

Project title:

FBS2021-36-Hammond: Plant dietary health - optimizing fertilizer uptake and utilization in crops

Lead supervisor: *Prof. John P. Hammond, University of Reading, School of Agriculture, Policy and Development*

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Co-supervisors: Prof. Andrew Thompson and Dr Daniel Simms, Cranfield University; Dr Katrin Hermann, Syngenta.

Project description:

Fertiliser inputs to agricultural productions systems are essential to maintain crop yields and quality. However, these inputs are economically costly and if managed inappropriately, damaging to the environment. With increasing pressure to develop sustainable agricultural systems there is an urgent need to manage these inputs whilst maximizing their benefits.



Working with Syngenta, this project will utilize a chemical biology approach to identify compounds that improve the uptake and utilization of fertilizers by plants. You will use state of the art plant phenotyping platforms to evaluate the impact of these chemical on growth. You will learn skills in big data and how to analyse the information derived from different cameras that are monitoring the plants as they grow. In addition, you will build knowledge on the analysis of plants for their uptake of fertiliser nutrients.

Once suitable compounds have been identified that affect nutrient uptake by the plants, you will have the opportunity to explore the underlying mechanisms in the plant, utilising a range of molecular and chemical approaches that will contribute to our wider understanding of nutrient uptake and use by crops. These will ultimately contribute to better management of fertiliser inputs in the future and help to reduce their environmental impact.

Training opportunities:

You will be provided with training in plant growth techniques, analysis of plant materials using Inductively Coupled Spectrometry, and using a 3D laser scanning multispectral camera to capture above ground plant structure and responses to chemical compounds. Further training in the use of the Lemnatec system will be provided. Depending on the your research direction, training in a range of molecular approaches to understand the fundamental mechanisms of target chemicals will be provided. Syngenta will provide training and understanding in the chemical screening of compounds and their selection for use in trials, supported by a placement for a minimum of three months as part of the CASE award.

Student profile:

The project requires a student with skills in chemistry or biology, with an interest in cross-disciplinary research and working with big data.

Funding particulars:

The project is kindly supported as a CASE Award with Syngenta. This will facilitate a 3 month placement with Syngenta and additional funding to support the research activities for the successful student.

The project is part of the FoodBioSystems BBSRC Doctoral Training Partnership (DTP), it will be funded subject to a competition to identify the strongest applicants.

The studentship is open to UK and international students (including EU countries) however due to funding rules, no more than 30% of the projects can be allocated to international students.

The funding will include a tax free stipend (minimum £15, 285 per year), support for tuition fees at the standard UK rate (currently £4,407 per year) and a contribution towards research costs.

Please note that the host universities have not yet confirmed the level of fees charged to international students funded by the DTP. Fee levels may vary across the institutions. This information will be shared on the FoodBioSystems DTP website as soon as it becomes available.

To apply

Please go to [FoodBioSystems DTP website](#) for information on how to apply for this studentship. The closing date for applications will be 8 February 2021.