Bridging the crop-soil-water phosphorus gap: Managing phosphorus for sustainable crop production and sustainable water

PhD Studentship for October 2020
Academic supervisor: Dr Jess Davies, Lancaster University
Industry supervisor: Andrew Burgess, Produce World

Phosphorus (P) sits at the heart of our DNA and the centre of our food system as a widely used agricultural fertilizer. Increased use of P fertilizers over the past 60 years has supported food production and growing populations, but their use also presents us with a number of inter-related sustainability challenges:

- Most of the P in chemical fertilizers is mined from phosphate rocks, and 90% of our reserves lie in a handful of countries leading to concerns regarding security of supply and long-term sustainability.
- Much of the P fertilizer applied to soils is not used by the crop, but gets locked-up in ‘organic’ forms that are not as easy for plants to access;
- Phosphorus can end up being lost from soils and fields to waterways, causing diffuse pollution that damages freshwaters and marine margins.

This exciting project aims to connect and advance our currently fragmented knowledge on P across crop, soil and water sciences through the development of novel modelling tools that help us tackle these important challenges to food security, sustainable water resources and healthy ecosystems.

Through data analysis, expert elicitation and modelling you will explore the crop and water sustainability implications of P management options across a range of agricultural systems. You will gain valuable insights into farm practice from working with project partner Produce World - one of the largest vegetable growers in Europe - and you will work with some of the richest experimental and monitoring datasets on P in the world from Rothamsted Research’s Long Term Experiments and Farm Platforms, and Lancaster University’s Demonstration Test Catchment in the Eden, Cumbria. Supported by a diverse supervisory team from Lancaster University and Rothamsted Research, you will gain highly valuable modelling skills and develop expert knowledge of plant-soil biogeochemistry, organic P, diffuse pollution and agriculture.

What is the CTP?
This funded project forms part of the Waitrose Collaborative Training Partnership (CTP) between the Waitrose Partnership, their international food production and supply companies, Lancaster University, University of Reading, University of Warwick and Rothamsted Research. The CTP will deliver studentships on the themes of sustainable crop production, sustainable soil and water and biodiversity and ecosystem services in agriculture. This project is based at Lancaster University.
Who should Apply?

Applicants should hold a minimum of a UK Honours Degree at 2:1 level or equivalent in relevant subjects such as Environmental Science, Geography or Natural Sciences. Strong quantitative skills and enthusiasm for developing modelling skills is essential.

Funding

Full studentships (UK/EU tuition fees and stipend (£15,009 2019/2020 tax-free) for 3.5 years for UK/EU students subject to eligibility criteria. Unfortunately, studentships are not available to non-UK/EU applicants.

A student must have:

- Settled status in the UK, meaning they have no restrictions on how long they can stay
- Been ‘ordinarily resident’ in the UK for 3.5 years prior to the start of the grant. This means they must have been normally residing in the UK (apart from temporary or occasional absences)
- Not been residing in the UK wholly or mainly for the purpose of full-time education. (This does not apply to UK or EU nationals).

For further information please Dr Jess Davies jess.davies@lancaster.ac.uk or for application queries contact Roz Wareing, r.wareing@lancaster.ac.uk. Visit the Waitrose CTP Website [http://wp.lancs.ac.uk/sustainable-agriculture/training/](http://wp.lancs.ac.uk/sustainable-agriculture/training/)

How to apply

Follow the instructions on How to apply of the Waitrose CTP website [http://wp.lancs.ac.uk/sustainable-agriculture/training/how-to-apply/](http://wp.lancs.ac.uk/sustainable-agriculture/training/how-to-apply/)

Send all applications to this unique email address as per the instructions on the website

Jess_Da.w8aj5oxxhgg53847@u.box.com

Deadline 17th February 2020 Midday