

FoodBioSystems DTP - PhD Project Advertisement

Project title:

FBS2021-49-Kourmpetli: Understanding seed longevity in weeds

Lead supervisor:

Dr Sofia Kourmpetli, Cranfield University, Plant Science Laboratory

Email:

s.kourmpetli@cranfield.ac.uk

Co-supervisors:

Prof John Doonan, Aberystwyth University, National Plant Phenomics Centre

Dr Angel Medina, Cranfield University

Dr Thomas Holloway, Syngenta Ltd.

Project description:

Efficient weed management in agricultural systems is key for achieving maximum potential yields and crop quality. The fate of weed seeds in the soil seedbank though is not well understood. Only a fraction of the seeds in the soil bank will germinate each year, but they often survive for longer in soil than in carefully controlled conditions of a modern seed store. Different accessions/strains vary in these traits even within a species. The basis of these differences is currently unknown but hampers the development of robust weed control strategies, from the screening of herbicides through to the development of appropriate agronomical practices.

The aim of the project is to investigate the underlying mechanisms that control weed seed longevity and develop cost-effective protocols for assessing seed quality (viability, germination and vigour) with a view to understanding variation in these traits in soil vs seed banks, within and between species.

The variability in seed quality and vigour will be evaluated using a range of biochemical, histochemical and molecular biology techniques as well as non-destructive methods to assess changes in seed over time. Accelerated ageing and controlled deterioration tests will be developed for the selected species under study in order to evaluate the long-term effect of the storage environment.

The knowledge generated will allow the student to identify common seed traits across phylogeny providing cost-effective methods for assessing seed quality for a wide range of weed species and providing the Syngenta team with recommendations on weed seed handling, monitoring and storage in order to evaluate longevity and germination traits of key weed species seeds.



Training opportunities:

In addition to advanced technical training provided by Cranfield and Aberystwyth Universities, the student will benefit from a minimum of 3-months placement at the **Syngenta Ltd**, Jealott's Hill site, where they'll gain a comprehensive understanding of the herbicide development operations and existing seed storage and testing procedures, as well as a wider overview of the business and R&D operations.

In addition, a 4-week placement will also be provided at the **Royal Botanic Gardens, Kew's Millennium Seed Bank** allowing the student to gain knowledge and valuable experience in seed conservation and storage procedures.

Student profile:

This project would be suitable for students with a BSc or MSc in plant sciences, crop sciences, biology, genetics or other closely related subject. The work will involve generating and managing large datasets, so good organizational skills and analytical ability would be essential. A strong interest in weed and/or seed science, as well as good oral and written communication skills would also be required.

Funding notes:

This is a CASE studentship, supported by Syngenta Ltd, a global agricultural technology company that produces agrochemicals and seeds.

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.