

Development of an attract-and-suppress control system for sustainable wireworm management

Project ID: 3534

Supervisory team

Rothamsted supervisor: Dr Jozsef Vuts (Rothamsted Research)

Academic supervisor: Dr Carrie Brady (University of the West of England (UWE))

Non-academic (CASE) supervisor: Dr Daniel Bahia (PheroSyn Ltd)

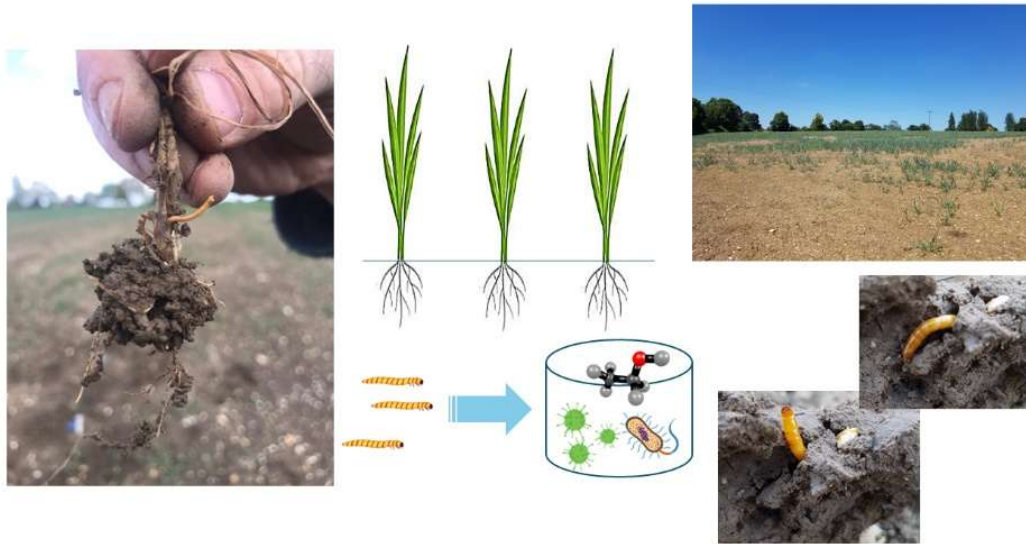
Other supervisors: Dr Tim Mauchline (Rothamsted Research), Dr Pete Maxfield (University of the West of England (UWE)) & Dr John Caulfield (Rothamsted Research)

Host institution: Rothamsted Research (Registered at University of the West of England (UWE))

CASE partner: PheroSyn Ltd

Project description: *Agriotes* spp. wireworms (Coleoptera: Elateridae) are major pests of cereal crops and root vegetables in Europe and North America. Seed treatment applications and other contact insecticides are used to protect crops from larval feeding damage. However, current chemical options are challenged in Europe because of concerns about their environmental toxicity, and it is very questionable when and if at all a new soil insecticide could be registered for wireworm management. Biologicals, such as natural products and microbes, act in a non-toxic mode of action and can provide an environmentally benign alternative for soil pest management. Similar to aboveground insects, soil-dwelling arthropods are also attracted to volatile natural products, and certain microbes (bacteria, fungi etc.) can naturally eliminate them, but the chance of successful infection in the vast soil matrix is slim. This project will develop an attract-and-suppress platform, building on an attractive blend we developed for wireworms. Identifying a suppressant for wireworms is a major aim of the project. Candidate soil bacteria in the UK Crop Microbiome Cryobank will be screened for their ability to infect and destroy wireworms. We will also test entomopathogenic fungi for their effect on wireworms. Promising microbial candidates will then be formulated with the attractant and tested in comparative experiments in laboratory and semi-field environments, that will also provide an understanding of volatile diffusion in soil. The wireworms will be collected from agricultural land, so the project work includes some travel across the UK. As this is a CASE studentship, you will have the opportunity to spend three months with the industry partner, PheroSyn, where you will learn a great deal about formulation science and commercial applications. You will be part of a collaborative team and benefit from tailored mentorship and professional development opportunities. The project provides a balanced blend of conceptual learning, hands-on experimentation, data analysis and professional development. You can expect structured, supportive supervision with a blend of independence and guidance appropriate for a PhD-level training environment. Regular supervisory meetings will review progress, troubleshoot challenges and plan subsequent work.

Day-to-day support will be available from the supervisors, particularly during initial training phases. As you develop competence and confidence, you will be encouraged to take increasing ownership of experimental design, data interpretation and project direction. Whether your interests lie in microbiology, chemical ecology or sustainable agriculture, this project will give you new and applicable skills essential for success in research and innovation. Continued on next page.....



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.