



The visual ecology of crop pests and their interactions with pest control products

Supervisory team:

Lead supervisors: Prof Martin Stevens (University of Exeter), Dr William Allen (Swansea University) Prof Chris Bass (University of Exeter), Prof Tariq Butt (Swansea University)

Collaborators: Dr Farooq Shah (Razbio Ltd)

Host institution: University of Exeter (Penryn), Swansea University Submit applications for this project to University of Exeter

Project description:

How can we grow more food on less land? Developing better tools for controlling crop pests is key. Visual traps are a key component of many integrated pest management strategies. Making traps work as well as possible enables improved monitoring and control, which increases yields, reduces pesticide use and associated greenhouse gas emissions, and facilitates organic status. In recent work we have demonstrated how incorporating the visual ecology of pests into the trap design process can find precise colours that dramatically improve trap capture rate.

The PhD project develops the visual ecology approach to trap design by considering additional stimulus attributes (e.g. pattern, polarisation, motion), and applying the approach to new pests, and in new contexts. Candidate trap designs will be manufactured with industrial partners and tested in lab-based experiments and field trials with growers in the UK and Europe. The student will learn and implement state-of-the-art visual ecology techniques and how to design, conduct and report lab and field-based trials of prototype traps. The student will have creative control under expert guidance to establish the specific direction of the research program. Target pests include Western flower thrips, greenhouse whitefly, Mediterranean fruit fly, South American tomato moth and cabbage stem leaf beetle. These are among the most important crop pests, causing billions of pounds in damage annually, and are current or future threats to UK growers. Work will also consider how incidental capture of beneficials such as pollinators, predators and parasites of pests can be avoided. The project would be ideal for a researcher interested in invertebrate vision and behaviour and how basic knowledge in these topics can help solve a major real-world issue. It would suit researchers interested in pursuing a career either in academia or the rapidly growing and rewarding integrated pest management industry.

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.