

Running to stand still; the ongoing evolution of a major agricultural weed

Supervisory team:

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Project description:

In evolutionary biology, the Red Queen hypothesis states that organisms must constantly adapt to maintain their fitness in the face of ever-evolving biological enemies and ever-changing environments. In other words, they must 'run to stand still'. This is particularly true in agriculture where the continual evolution of yield-robbing pests allows them to outwit and outsmart the modern technology that is designed to control them. The rapid and ongoing evolution of pest species in agriculture provides a textbook example of contemporary, human-directed evolution. For this project we have access to a national collection of wild blackgrass populations with detailed field selection histories and a fantastic opportunity to combine state-of-the-art eco-evolutionary, genetic, genomic and analytical approaches to tackle one of the most pressing issues in modern agriculture and food security – the 'superweed' that is blackgrass. You will work with a team of plant ecologists, evolutionary biologists and molecular geneticists to unravel the mysteries of the rapid evolution of a plant species that causes £0.5 billion of crop loss each year in the UK. In doing so, you will address fundamental questions in evolutionary genetics and seek biological insights that will improve prospects to sustainably increase agricultural production.