

SLIMERS



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“Sometimes trials work, and sometimes they don’t – but the best place to do them is on your own farm and as a group we’re learning a lot about slug behaviour.”

Graham Potter, arable farmer and BOFIN member, Yorkshire



“Farmers have a choice. Either we sit by and carry on spending year after year on slug pellets, or we do something about it, and potentially take a step change in how we farm.”

Tom Pearson, arable farmer and BOFIN member, Cambridgeshire.



Join Slug Circle

## About SLIMERS

Strategies Leading to Improved Management and Enhanced Resilience Against Slugs (SLIMERS) is a three-year £2.6M research programme involving more than 100 UK farms and six partners.

SLIMERS is funded by the Small R&D Partnership Projects, part of Defra’s Farming Innovation Programme. Defra are working in partnership with Innovate UK, the UK’s innovation agency, who are delivering the programme. Project number: 10053286.

# SLIMERS A revolution in slug control

Farmers working with scientists to develop precision solutions for sustainable slug management

LED BY FARMERS, BACKED BY SCIENCE





## Slimers at a Glance

### What is it about?

SLIMERS is a new £2.6M farmer-led research programme set to change the way slugs are monitored and treated, in a bid to drive sustainable solutions for slug management.

Slugs are arable farming's biggest pest issue, estimated to cost the UK industry about £43.5M per year.

Since the ban on metaldehyde, there is now only one form of chemical control for slugs – ferric phosphate pellets – so protecting the longevity of this will require both a strategic and precision approach to slug management.

### What are the project aims?

The aims are to reduce reliance on slug pellet usage and advance alternative biological control via an economically viable approach.

The project will achieve this by building on previous work in this area and will combine expertise from across the consortium to develop cost-effective digital autonomous slug monitoring, forecasting and patch/spot treatment for both conventional and alternative biocontrol agents, delivered as an end-to-end service model.



More information can be found online at [slimers.co.uk](http://slimers.co.uk) or contact [info@bofin.org.uk](mailto:info@bofin.org.uk) to join the Slug Circle community.

### Who is running the project?

The project partners comprise a consortium of UK companies, research institutes and farmer networks, led by BOFIN (British On-Farm Innovation Network).

### Who is it for?

SLIMERS is designed to be collaborative and therefore suited to anyone who is facing significant slug challenges and/or those who are looking for alternative, precision techniques for control.

### Can I be involved?

Absolutely – in fact, farmer involvement is integral to the success of this project. The 'Slug Circle' will be at the core of this – a platform and knowledge exchange hub designed to facilitate discussion, idea sharing and tips for best practice when it comes to slug burdens and controlling them.

From this community, 30 'Slug Sleuths' will be selected and paid to host trials on their own farm to test the technology and help researchers learn more about slug behaviour in a bid to create a long-term solution.

## Project Overview

Led by Dr Jenna Ross OBE of CHAP, two specific services will be developed during the course of the project. These will be tested infield by farmers, while lab work will refine game-changing technologies, develop understanding of slugs and their management.

### Slug patch location forecasting

Harper Adams University leads this stage of the project which involves the development of location forecasting for patches with higher slug numbers than occur in the rest of the field.

This builds on earlier work by challenging and confirming the hypothesis that selected factors (% sand, % clay, % silt, organic matter content) are strongly related to slug patch location and can therefore be used to target treatment applications as part of a patch treatment method of control.

As the selected factors all affect soil moisture retention, researchers will trial the re-use of soil maps produced for other purposes using ECN scanning and the Omnia system, to test their use as proxies for soil sampling/analysis in a commercially viable system as part of the drive to find cost-effective methods for patch location prediction.

The efficacy of control achieved by patch treatments will be analysed by comparing economic outcomes of patch treatment and full field treatments. This tests the hypothesis that patch treatment can significantly reduce the amount of molluscicides used, while still maintaining slug populations across the field at levels below the AHDB damage/treatment threshold.

Agrivation will aid in-field data capture through a series of on farm trials.

### Developing autonomous solutions

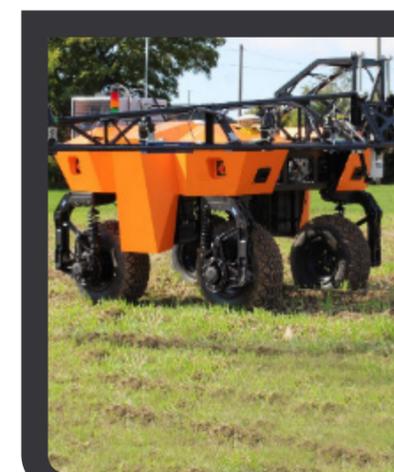
This stage of the project advances the development of autonomous robotics for identifying slugs in the field and spot-treating them with advanced alternative biological control.

CHAP will work with project partners Small Robot Company (SRC) to develop the existing SlugBot technology to enable per-slug intelligence and precision control. Working with CHAP's Digital Phenotyping Laboratory at Rothamsted Research, SRC will refine the sophisticated AI modelling using diverse datasets from farms across the UK. This will result in a commercial prototype robot that can track and treat slugs without using any pellets at all.

### On-farm trials and in-lab analysis

To test the commercial viability of the solutions, 30 'Slug Sleuths' recruited by BOFIN will be paid to carry out on farm trials. The trial protocols will be developed in collaboration with scientists to ensure high quality data, but delivered by boots on the ground to illustrate whether or not these solutions are viable in 'real-life' scenarios.

In parallel to the field trials, lab work carried out at John Innes Centre Insectary will look in detail at slug feeding behaviour to inform how the field trials develop and the AI algorithms that underpin the field monitoring. This includes screening of wheat genetics developed following previous work that identified a landrace wheat consistently spurned by slugs. Those lines showing promise will be multiplied up for field trials in the later stages of the project.



### Commercial development

At the end of the project, the findings will be amalgamated as part of the commercialisation strategy to deliver digital slug monitoring, forecasting and precision tools as an end-to-end service model.