

Studying springtails to improve soil health

Harper Adams University

Current Postgraduate Research Briefing



What are springtails?

Feeding a growing human population requires not only healthy plants and farm animals but also relies on healthy soils. A group of beneficial soil invertebrates, known as springtails, could have the potential to improve soil quality.

Springtails are insect-like invertebrates (see photo, right) living in the soil which help decompose organic matter. This releases nutrients which could then be available for plant growth. Different springtail species group together to form soil communities, which can reach up to 100,000 per square metre.



Previous research has shown that, under intensive farming practices, such as deep cultivation, and frequent agrochemical application, the total numbers and species of springtails decline. But some springtail species survive and even thrive under these conditions. We don't yet understand why.

Study aim

This study aims to examine the effect of farm management techniques on the soil populations and species of springtails. Two questions are being researched.

- Do the numbers and species of springtails change with different cultivation techniques?
- Do some species have particular traits such as size, furcular (tail) length, body shape, or lifecycle length to allow survival?

Use of The Princess Margaret Laboratories

Soil samples are taken from fields under increasing management intensity, such as pasture, grass ley and arable fields, on the Harper Adams University farm. Springtails are then extracted using **Tullgren funnels** in **the Princess Margaret Laboratories**. Species identification is on-going in **the Jean Jackson Entomology Building** (see panel).



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So far....

Twelve different springtail species have been found in the farm soil samples. Now, the particular survival traits of the different species are being studied. Ultimately, the knowledge from this research could influence future soil quality and help grow healthier crops.

PhD programme

This briefing outlines the work of a three-year PhD research programme by **Francisca Sconce**, *Postgraduate Researcher*.

Director of Studies :

Prof. Simon Leather, *Professor of Entomology*,

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The Jean Jackson Entomology Building

Microscopes in **the Jean Jackson Entomology Building** are used to identify and study the characteristics of individual springtails (see photos, above). The groupings of different species within the samples are being compared.



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