



Protecting the Nation's Soils

# Soil biodiversity and ecosystem function

Bryan Griffiths<sup>1</sup>, Eric Paterson<sup>2</sup> and Bruce Ball<sup>3</sup> Email b.griffiths@scri.ac.uk

<sup>1</sup>Scottish Crop Research Institute, Dundee, <sup>2</sup>The Macaulay Institute, Aberdeen, <sup>3</sup>Scottish Agricultural College, Edinburgh

## Why value soil biodiversity?

The diversity in soils is several orders of magnitude higher than that above-ground but it is also the last mysterious frontier for terrestrial biodiversity. For many centuries, humans have relied directly on soil biodiversity to provide food (e.g. mushrooms, roots) and medicinal products (e.g. antibiotics) but we also rely upon this diversity for less obvious, but no less important, requirements. We are especially reliant upon the interactions of soil biodiversity with soil chemical and physical properties to maintain the functioning of our ecosystems, whether they be agricultural or native habitats.



## Our tasks for Scotland

- Develop appropriate tools to identify our soil microfauna and flora and their specific roles in ecosystem function
- Develop practical recommendations on how to protect and enhance soil biodiversity in Scotland

## Our approach

We are taking a holistic approach by looking at soil biological, chemical and physical properties in both laboratory and field experiments. Our team is working intensively at a range of experimental sites across Scotland (arable site at SCRI pictured) to explore the function of soil biodiversity in agricultural and non-agricultural soils of Scotland.



## Key questions

- What soil biodiversity will we find?
- How is soil biodiversity influenced by land use?
- How is soil biodiversity regulated by carbon inputs e.g. compost or plants?

## Supporting decision-making

- A major challenge will be to use this vast array of information to provide a system-level understanding of sustainable soil use with practical recommendations for soil management
- One output will be a state-of-the-art decision support model that can show how management alters water repellency, activity of soil biodiversity and availability of nutrients to crops with the resultant consequence for soil quality

