





The effects of erosion on the soil biota in

agroecosystems: nematodes as a model organism Craig Baxter ^{1,2}, John S. Rowan¹, Blair M. McKenzie², Roy Neilson²

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<u>Overview</u>

Agricultural intensification may increase erosion risk, threatening soil quality and ultimately the environment. We need to understand the links between land use, erosion and ecosystem services.

Physical erosion processes are well documented. Few studies attempt to quantify losses of soil biota to erosion, or seek to understand the physical processes influencing their loss. This project Initial results (Figure 3) show soil nematodes *are* mobilised in runoff, and suggest possible links between conservation practice and abundance of eroded nematodes.



will use nematodes (Figure 1) as a model organism to study the impact and consequences of erosion on the soil biota.



Nematodes are ubiquitous in soil environments, and are keystone organisms in the soil food web.

Developing a research approach

♦ Plot-scale study:

Preliminary experiments are developing methodology to understand how rainfall detaches nematodes from the soil, and how, in a controlled environment, erosion affects nematode assemblages.



Catchment-scale study:

The discrete catchment of JHI's Balruddery Farm is a test site for transport from the landscape. Instruments have been installed at the outlet of a culvert system to:

- collect runoff samples,
- trap nematodes,
- record water levels and sediment concentrations,
- automatically sample during rainfall events.

This experiment will provide data to characterise the soil nematodes being transported through the catchment .



♦ Field-scale study:

As part of a wider study into soil compaction and erosion, we are quantifying and characterising the nematodes eroded under different tractor tyres. We are building on the findings of a body of literature that suggests soil nematodes are transported by runoff, and can be found in surface waters in different land use catchments.



Figure 5: Balruddery Culvert Hydrological Catchment and Gauging Station