

## MSc Research Opportunity – Soil Mystery: Where Does the Nitrogen Go?

*Greenhouse experiment & modelling on nitrogen dynamics in sandy soils*

Over the past two years, our field trials on fertilized sandy soils under intensively managed grasslands have yielded an intriguing result: although nitrogen (N) was applied as both organic and mineral fertilizer, only about 70% of it was accounted for in plant uptake and soil water. The rest – a surprising 30% – neither leached from the root zone during the growing season, nor ended up in the biomass.

### So where did it go?

This question has drawn the attention of the Dutch sports turf sector and fertilizer producers such as Culterra. Understanding the fate of this "missing" nitrogen is essential to improve fertilizer strategies, reduce environmental risk, and guide future product development.

### Research focus

This MSc project will explore the mechanisms behind nitrogen retention and transformation in sandy soils using a controlled **greenhouse pot experiment**. You will apply both organic and mineral N fertilizers and track nitrogen through:

- **Plant compartments** (shoots and roots)
- **Soil** (including bound forms and organic matter)
- **Soil water** (leachate and pore water samples)

You'll work with **hydrological and nutrient models** to simulate water and nitrogen fluxes, and gain insight into soil biological and chemical processes that affect nitrogen fate over time.

### What will you learn?

This is a large and ambitious MSc project, but also a unique opportunity to gain hands-on experience with:

- Greenhouse experiments and sampling techniques
- Soil chemical and biological analysis
- Environmental modelling tools (e.g. HYDRUS, nitrogen models)
- Scientific writing and presenting for both academic and industry audiences

### Who are we looking for?

A motivated and structured MSc student with a strong interest in soil science, plant-soil interactions, or nutrient cycling. Prior knowledge of soil chemistry and biology is essential. Modelling experience is a plus, but not required.

### Timeline

- **Start:** May 2025
- **Duration:** 4–5 months (until August/September)

The success of this research will depend on your enthusiasm and precision – but in return, you'll gain a deep understanding of one of the most pressing nutrient questions in grassland management.

### Interested?

Get in touch with us to learn more or apply!

Mail: [thomas.evers@lumbricus.nl](mailto:thomas.evers@lumbricus.nl) tel: 0683563064

Kind regards, Thomas 😊