PhD: Soil structural degradation and nitrous oxide emissions

Soil structural degradation is a significant threat to both NZ and global ecosystems. This degradation has profound consequences, including loss of production, and increased risk of soil erosion, nutrient loss, and GHG emissions.

Current methods for assessing soil structural vulnerability rely on traditional, non-functional properties. These provide inadequate predictions for soil ecosystem services like plant production and GHG mitigation.

With funding from the New Zealand Smart Ideas programme, this project will focus on the dynamic functional properties of soil structure (e.g. relative gas diffusivity) and their relationship with greenhouse gas emissions (GHG) with a focus on nitrous oxide emissions. Through experimentation and modelling, the candidate will evaluate how dynamic functional properties and N_2O emissions respond to soil compaction.

The PhD candidate will be embedded in a team of experts comprising soil science, environmental science, biophysical modelling, and crop production, and be based in the Lincoln Research hub. The supervisory team comprises of Prof. Tim Clough and Dr Chamindu Deepagoda (Lincoln University), Dr Wei Hu, and Dr Rogerio Cichota (Plant & Food Research), along with an advisory team: Dr Brent Clothier (Plant & Food Research), Dr John Drewry (Manaaki Whenua – Landcare Research), and Prof. Stephan Peth (Leibniz University Hannover, Germany). The candidate will contribute to new knowledge in soil and environmental science through the development and application of skills in several of the following areas: soil physics, soil mechanics, stable isotope techniques, nitrogen cycling and GHG emissions, molecular biology, data analysis and modelling.

A tax-free annual stipend of $40,000 (NZD) per year, for up to three years, and Lincoln University tuition fees, for up to three years, will be provided.

The candidate should be ready to commence their studies 20th January 2025.

How To Apply

To apply please send your CV and cover letter via email by 30th November 2024.

Prof. Tim Clough
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Entry requirements:

Preferred candidate's skills and experience:

- Good time management of tasks and deadlines.
- Curiosity and a willingness to learn.
- Creativity and problem solving.
- An ability to formulate a hypothesis.
- Background/undergraduate study in soil science or related fields.
- Ability to collaborate effectively with colleagues and peers.
- The ability to critique and synthesis literature, analyse data and the ability to produce scientific written outputs.

Are you eligible?

- The PhD is open to those who meet the entry level requirements for a PhD at Lincoln University, New Zealand, and is open to New Zealand citizens, residents and international candidates who can meet the appropriate visa requirements.
- The programme will be looking for a diversity of skills across the successful applicants.
- PhD applicants must be eligible at the time of application to register as a candidate for a Doctoral degree at Lincoln University or expect to become eligible by January 2025

Candidates who already have a doctorate in an applicable/related field are not eligible for consideration.