

PhD Opportunity, Department of Soil Science University of Saskatchewan, Canada

Microbial drivers of soil N₂O emissions from enhanced efficiency nitrogen fertilizers

Dr. Bobbi Helgason is seeking a PhD student to conduct research to examine how climate and soil type interact with fertilizer management to affect the performance of enhanced efficiency N fertilizers in annual crop production. The student's project will involve field and controlled environment studies that employ DNA and RNA profiling (sequencing and qPCR of N cycling genes and transcripts) and stable isotope tracing to understand microbial N cycling. Candidates interested in learning about 4R Nutrient Stewardship (right source, rate, time, and place) by understanding microbial processes contributing to N₂O production and consumption are encouraged to apply. The student will learn a diversity of complex laboratory techniques in soil microbiology and biochemistry. The Department of Soil Science is home to a newly updated Stable Isotope Facility with state of the art capacity for isotope tracing in soil and microbial biomarkers as well as gaseous emissions (¹⁵N₂O/¹⁵N₂). This project is part of a larger nationwide project "CanN₂O Net – A Canadian Nitrous Oxide Collaboration Network to Meet Greenhouse Gas Emission Reduction Targets" funded by the NSERC Alliance Sustainable Agriculture Research Initiative. Collaboration with research teams in the Department of Plant Sciences and Soil Science at the University of Saskatchewan and the University of Guelph will provide enhanced training opportunities.

Interested students should have the following qualifications:

- Masters of Science in soil science, microbiology, environmental science, agronomy, or related discipline
- Sound understanding of microbial processes of soil nitrogen cycling, including N₂O production and consumption
- Excellent written and oral communication skills
- Ability to work independently and in teams
- Experience in a laboratory work environment is required

Students will be paid a stipend of \$27,000 per year for 4 years. Additional scholarship opportunities are available. Students have the option to be part of the Food-Water Nexus Education & Training NSERC CREATE program.

Interested candidates should submit a CV, a one page statement of research interest, and unofficial transcripts to bobbi.helgason@usask.ca.

Start date: September 2024 or January 2025

Website: researchers.usask.ca/bobbi-helgason/index.php