

Postdoctoral position in Modeling Environmental Nitrogen Losses from Corn Production, School of Environmental Sciences, University of Guelph

We are seeking candidates for a post-doctoral fellowship with research focus on improving nitrogen management tools for reduced environmental losses from corn production. Research activities will involve validation and testing of a process-based model using an extensive data set on nitrous oxide emissions and nitrate leaching from corn. The validated models will be used to assess greenhouse gas emission intensity of Ontario's corn sector and to evaluate the province-wide impact of 4R mitigation practices on environmental N losses. This one-year position will commence September 1, 2015 (start date flexible), with the possibility of a one year renewal contingent upon performance and funding availability. Please submit a cover letter stating your interest and experience in nitrogen cycling modelling and agricultural research, curriculum vitae, and the names of two potential references to Dr. Claudia Wagner-Riddle (cwagnerr@uoguelph.ca) immediately. The position will be based at the University of Guelph situated in Guelph, Ontario, Canada.

Project Summary

The production and supply of nitrogen (N) fertilizer is the largest single energy input to Ontario corn production systems and results in substantial environmental losses. The 4R Nutrient Stewardship program has potential for reduction of N losses to water and air, but this impact is not well described in N management decision tools. A 3-year project with funding from the Ontario Ministry of Agriculture and Food, and support from the Canadian Fertilizer Institute and Grain Farmers of Ontario aims at contributing to the long-term sustainability of corn production through the improvement of a decision support system that can enhance the management of corn agro-ecosystems. The objectives of this research are to 1) Improve, validate and test an established model that predicts year-long environmental N losses in corn for Ontario conditions; 2) Update a county-level inventory of N₂O emissions from corn production using this improved model; 3) Evaluate the effectiveness of 4R mitigation practices to reduce N₂O emissions and the environmental footprint of corn production systems province-wide. This will be accomplished by making use of past year-round field measurements of environmental losses conducted in Ontario. This research will provide an improved modeling platform and information to policy analysts, corn producers and the fertilizer industry on estimates of reduction that can potentially be achieved with adoption of 4R management practices.

Qualifications

- PhD degree awarded within the last four years in a science or engineering program, with emphasis on soil or crop science
- Ability to work independently, have excellent organizational and problem solving skills
- Experience with biogeochemical models (e.g. DNDC, DayCent, ...) and agricultural research
- Programming ability in Fortran and Matlab would be an asset
- Capacity to lead substantial research activities, communicate research results (written and orally), and to prepare peer-reviewed publications