

Understanding N dynamics in eroding landscapes under agricultural management

The Leibniz-Centre of Agricultural Landscape Research (ZALF e.V.) announces a BSc/MSc thesis topic within the Working Group “*Isotope Biogeochemistry and Gas fluxes*” of the Research Area 1 “Landscape Functioning”.



Background:

The Earth's land surface is dominated by sloping landscapes. Annually, about 39.5 of soil are lost through water, wind or tillage erosion from the world's terrestrial ecosystems (Borrelli *et al.*, 2017). The loss of soil particularly reduces the productivity of agricultural ecosystems and thus is one of most serious threats facing world food production. As soils are a major terrestrial reservoir of organic carbon (C) and nitrogen (N), soils play also a key role in the global C and N cycle (Quinton *et al.*, 2010). Until now, a growing number of studies have been focussing on the impact of soil erosion on biogeochemical cycling of C, while less attention has been paid on understanding N dynamics in eroding landscapes. In order to identify and quantify the effects of eroded soils on N dynamics and storage, pot experiments using ^{15}N tracing approaches will be conducted as a first step.

Tasks and requirements:

- Performing of pot experiments in the greenhouse
- Using ^{15}N tracing techniques
- Data processing and analysis (using MS Excel and R)

Opportunities and duration:

The thesis is part of a bigger project dealing with the impact of soil erosion on the C and N cycling of agricultural landscapes. Insights in a broader variety of stable isotope measurement techniques and methods will be provided. Applications are accepted in English and German. Due to its setup, the duration of the experiment will be 3-4 month, starting in May/June 2018.

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