The Group of Plant Nutrition in collaboration with the Group of Inorganic Environmental Geochemistry at ETH Zurich invites applications for a PhD position on zinc and cadmium transfer from soil to wheat.

For the ETH funded project "Delivering wheat (Triticum aestivum) with high zinc and low cadmium content for human nutrition through the addition of organic matter of agricultural origin and improved use of soil zinc (acronym: OMAO4Wheat)".

The project aims at investigating how concentration of zinc (Zn) in wheat grain can be increased, while minimizing the concentration of cadmium (Cd), via addition of organic matter of agricultural origin (OMAO) (e.g., fresh plant residues or compost) to soils. In a first work package (WP), different types of OMAO will be sampled, and their effect on Zn and Cd contents in wheat grains will be quantified. The impact of soil biological activity on Zn and Cd release from soil to the solution and complexation by dissolved organic matter following the application of OMAO will be studied in the second WP. The effect of adding OMAO to alter the Zn and Cd uptake of a Zn-efficient and a Zn-inefficient wheat cultivars and Zn and Cd complexation by dissolved organic matter will be analyzed in the third WP. Enriched stable Zn and Cd isotopes approaches will be used throughout the project to quantify, in the different soil and plant compartments, the amounts of metals which are derived from the soil and from the added OMAO. State-of-the art techniques, i.e. liquid chromatography coupled to inductively coupled plasma tandem mass spectrometry (LC-ICP-MS/MS) will be used to quantify the organo-metal complexes.

We are looking for a highly motivated PhD candidate with the necessary skills to plan and carry out the aforementioned tasks independently. The candidate will be required to travel to national and international workshops/conferences, contribute to group activities, work in interdisciplinary teams, and publish research findings in internationally peer-reviewed journals. Applicants should hold a Master's degree in environmental or agricultural science. It is desirable that the candidate has prior experience in soil, metals, stable isotopes, geochemistry and/or analytical chemistry. Fluency in English both written and spoken, is mandatory. The PhD candidate will be based at the Research Station Lindau-Eschikon campus of the ETH Zurich, and will also work at the ETH Zentrum campus and at EAWAG (www.eawag.ch). The position is limited for 3 years. The position will start by the 1st of April 2019 but other starting dates can be discussed.

We look forward to receiving your online application. Please include a letter that clearly demonstrates your motivation and suitability for the position, a curriculum vitae, full transcripts of your Bachelor and Master degree (or equivalent), a copy of your diploma/Master degree thesis, academic certificates and contact information of three referees. Please address your application to Prof. Emmanuel Frossard. We will continue to advertise the position until a suitable candidate has been found.

For more information about the position, please contact Prof. E. Frossard at emmanuel.frossard@usys.ethz.ch and visit our websites: www.plantnutrition.ethz.ch (Plant Nutrition Group) and www.ieg.ethz.ch (Inorganic Environmental Geochemistry Group).