



Tropentag, September 14-16, 2010, Zurich

“World Food System —
A Contribution from Europe”

Improving Soil Zinc Bioavailability in Response to Crop Residues and Wheat Zn Efficient Genotype

VAJIHEH DOROSTKAR¹, MAJID AFYUNI¹, AMIR HOSSEIN KHOSHGOFTARMANESH¹, RAINER SCHULIN²

¹*Isfahan University of Technology, Department of Soil Science, Iran*

²*ETH Zurich, Institute of Terrestrial Ecology, Switzerland*

Abstract

Zinc (Zn) is an important micronutrient in human diet because of different anatomic and physiologic functions in human bodies. Zinc deficiency in human results from diets that are low in bioavailable Zn especially when cereals and legume are stable food that are mainly cultivated in Zn deficient soils. In arid and semi-arid regions like Iran, soils are high in total zinc but readily plant available Zn is limited due to soil properties. High pH, alkalinity and phosphor are main reasons for low Zn bioavailable in these areas.

Soil organic matter has a variety of direct and indirect influence on the phytoavailability of micronutrients in soil and their uptake by plants. They are considered as an important source of several micronutrients like Zn. The affect of organic matter depend on dissolution of Zn-organic complex. In calcareouse soils like Iran, organic acids produce during crop residues decomposition may increase plant Zn uptake by dissolving Zn from solid phase to soil solution. In most of arid and semi-arid regions, very little or no crop residue is left in the field and most of them used as animal food or fired in the field. Zn availability in Iranian soils can be improved by making combination between these organic residues and Zn efficient wheat genotypes.

For this reasons a project was conducted with the following aims: 1. Evaluating different common crop residues in Iran including safflower, sunflower, bean, clover and sorghum on bioavailability of Zn during wheat cultivation; 2. Investigating the effect of Zn efficient genotypes in contrast with non-efficient genotypes on chemical properties of rhizosphere in related to Zn availability; 3. Assessing the DOC concentration in response to plant residues and wheat genotype as an important factor for Zn bioavailability. The results including Zn concentration, DOC, pH and microbial respiration in soil during wheat growth, are being analysed and will be prepared and presented.

Keywords: Crop residues, wheat, Zinc, Zn-efficiency