

**TITLE:** *Assessment of the complexation capacity of soil solution comparing no-tillage and conventional cropping systems.*

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### **ABSTRACT**

In the search for handling systems that favor the soil chemical, physics and biological properties improvement, the no-tillage cropping system (PD) choice is shown favorable when compared to the conventional cropping system (PC). Besides the no-tillage cropping, the use of cropping rotation systems with covering plants and green manuring along the time, provide increase of the soil organic matter and chemical alteration of the soil solution. The increase in the leaching of soluble compounds of low molecular weight, capable of form organic complexes with metals alters the ion mobility affecting their availability and toxicity. In this context, this study had as objective evaluates the complexation capacity of the soluble organic carbon (COS) in the soil solutions with  $\text{Cu}^{2+}$  ions, using a copper ion selective electrode (Cu-ISE), starting from the incubation of soils with plant residues. The soil samples were collected in the layers of 0-10 and 40-50 cm. In experiments of long period under systems of soil handling PD and PC, the samples were collected in the layer of 0-10 cm. The complexation capacity of aqueous extracts of plant residues presented the following decreasing order among the residues: corn > soybean > lupine > oat > turnip. When the soils with different amounts of organic matter and texture were incubated with plant residues (4% m/m), the COS/ $\text{Cu}^{2+}$  complexation capacity was related with the carbon and soluble cations amounts in the different residues, presenting the following order: lupine> turnip> oats> corn> soybean. In the case of the soil handling systems, the PD soil solution presented larger COS/ $\text{Cu}^{2+}$  complexation capacity than of the PC, in agreement with the largest organic carbon amount in the first. The complexation capacity increased proportionally with the increase of the temperature in the extraction of the soil solution. The complexation capacity is one more tool to aid in the interpretation of data related to the study of soil handling systems. The proposed methodology was shown appropriate for the evaluation of the complexation capacity of the soil solution with copper, having as advantages low cost and simplicity of the analyses execution.

**Key words:** no-tillage cropping, soil solution, soluble organic carbon, complexation capacity.