

EFFECT OF SOME HUMIC ACIDS ON WHEAT PLANT GROWN IN DIFFERENT SOILS

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ABSTRACT

A pot experiment was conducted to study the effect of four humic acids extracted from different composts on wheat plant (*Triticum aestivum* L. cv. Yecora rojo) grown in a highly calcareous loamy sand soil ($\text{CaCO}_3=28\%$) and in noncalcareous sandy soil ($\text{CaCO}_3=4.2\%$). The humic acids were applied at five rates (0, 50, 100, 150, and 200 kg ha⁻¹). All pots received 30% of the recommended amounts of inorganic fertilizers (N, P and K).

The obtained data show that the available nutrients (P, K, Fe, Mn, Zn and Cu) were higher in noncalcareous soil in compared to the calcareous soil. The results also show that increasing the rates of the investigated humic acids resulted in an increase in the organic matter content in the two studied soils, the macro and micronutrients uptake (N, P, K, Fe, Mn, Zn and Cu) by wheat plant and its yield (grain and straw).

Application of humic acid which extracted from the animal compost gave the highest values of available nutrients, organic matter content, yield and yield components as well as nutrients uptake by wheat plant. This indicates that this humic acid is in a good mature state than the other studied humic acids.

Keywords: humic acids, available nutrients, composts, wheat plant.

INTRODUCTION

Modern agriculture replaced organic materials with chemical fertilizers. This trend has been reversed in recent years and the desire to utilize organics and recycle organic matter using field application has increased. These amendments can improve soil physical structure by increasing water holding capacity or reducing soil bulk density. They can also improve soil chemical properties by increasing cation exchange capacity or buffering soil pH to provide more soil environments for plants under a wide range of soil conditions (Schnitzer, 1992).

Numerous publications since the early years of this century refer to humic substances as plant growth promoting factors. Relations of humic substances with plant growth have been critically reviewed by Chen and Aviad (1990) and Chen *et al.* (1994). In their review, they described growth promoting effects in cereals such as wheat, barley and corn. Stimulation of root growth and enhancement of root initiation have commonly been found.

Research by Lee and Bartlett (1976) indicated that application of humic acids to a sandy soil low in organic matter or to nutrient solutions improved plant growth compared with the control. Metwally *et al.* (1976) demonstrated that the addition of humic acids to Nile suspended matter amended with CaCO_3 increased Fe, Zn and Cu uptake by barley plant. El-Gala (1978) found that the addition of previously isolated and purified humic acids resulted in an