

Interaction effects of Zinc and Manganese on growth, uptake response and chlorophyll content of sweet corn (*Zea mays* var. *saccharata*)

Abstract

Manganese (Mn) and Zinc (Zn) interact with each other and this interaction can result in impacts on the yield of corn plants. This study was conducted to examine the effect of different levels of Mn and Zn on the yield, Mn and Zn concentration, root growth parameters and chlorophyll contents of corn plants. Sweet corn was grown in nutrient culture containing all combinations of Zn and Mn at levels of 0.0, 0.1, 1.0 and 10.0 mg L⁻¹ as ZnSO₄·7H₂O and MnSO₄·H₂O, respectively and harvested at 28 days after transplanting. Mn and Zn concentrations in roots and shoots increased with increasing Mn and Zn concentration in nutrient solution. Zn concentration in both roots and shoots enhanced with increasing Mn levels. Mn concentration in shoots did not show any correlation with Zn concentration in nutrient solution, but Mn concentration in roots decreased with increasing levels of Zn. Zn₀Mn₁ treatment produced the highest yield. The lowest dry weight of young corn plants was recorded under Zn₁₀Mn₀ treatment due to Mn deficiency. Chlorophyll content decreased with high Zn application and this can be attributed to the interaction of Zn with iron in the growth medium. Different levels of Zn and Mn in nutrient solution did not have any significant effect on root parameters.

Keyword: Zinc; Manganese; Corn; Concentration; Chlorophyll