

Phosphorus and zinc uptake and their interaction effect on dry matter and chlorophyll content of sweet corn (*Zea mays* var. *Saccharata*).

Abstract

Zinc and Phosphorus have antagonistic effect on the absorption and translocation of each other in plants. P-induced Zn deficiency is more common than Zn-induced P deficiency because growers commonly apply large amounts of P fertilizer as compared to Zn fertilizer. This research was conducted to examine the effect of different levels of Zn and P on the yield, Zn and P uptake and chlorophyll contents of corn plants. Sweet corn was grown in nutrient culture containing all combinations of Zn as $ZnSO_4 \cdot 7H_2O$ at levels of 0.0, 5.0, 10.0 and 20.0 mg L⁻¹ and of P as KH_2PO_4 at levels of 0.0, 20.0, 40.0 and 80.0 mg L⁻¹. Zn₀P₂₀ treatment produced the highest yield and the yields were decreased with P application in combination with Zn. The lowest dry weight of young corn plants was recorded under Zn₀P₈₀ treatment at both harvesting times due to both Zn deficiency and P toxicity. Chlorophyll content decreased with high Zn and P applications and this can be attributed to the interactions of Zn and P with iron in the growth medium. Zn₀P₈₀ treatment had the lowest Zn and the highest P uptake by shoot at 14 days after transplanting. The study has shown that Zn deficiency can enhance P uptake and translocation to such an extent that P may accumulate to toxic level in leaves. Zn₂₀P₈₀ treatment produced the highest Zn and P uptake by roots. Zn and P uptake by roots increased with increased Zn and P supply.

Keyword: Zinc; Phosphorus; Corn; Uptake; Chlorophyll.