

EFFECT OF K SUPPLY ON GROWTH AND DEVELOPMENT OF MAIZE (ZEA MAYS L.)

Muhammad Ashraf, Muhammad Yousaf, Z.I. Ahmad and Amir Aman ullah*

ABSTRACT

The objective of this study was to quantitatively determine and to separate the effects of potassium deficiency on growth and development of a maize plant. Maize varieties V₁ (Sadaf) and V₂ (Sultan) were grown in a sand culture. When the coleoptile leaf was fully expanded, three level of K supply i-e K₀ = 8 mM; K_M = 4 mM and K_{ZERO} = 0 mM were established by varying K concentration in the Long Ashton nutrient solution. The supply of respective nutrient media was maintained from coleoptile leaf stage through silking. A thermal time in growing degree days (GDD) was calculated to characterize the thermal environment of the corn plants. The leaf area was estimated daily non-destructively as a measure of growth of a maize plant. Number of leaves per plant, irrespective of a leaf size and the number of leaves per plant in Haun scale were used as a measure of development of a plant and were also recorded on daily basis. There was straight-line linear relationship between the number of leaves of V₁ and V₂ and the thermal time since sowing for each level of K supply. The development rate of V₁ and V₂ in K_{ZERO} level was 10 and 15%, respectively slower than that in K₀ level. At leaf stage II, the leaf area in K_{ZERO} was about 46% less than the leaf area in K₀; and the leaf area in K_M was about 25% less than the leaf area in K₀ supply. At the stage of tasseling, the leaf area in K_{ZERO} was about 37% less compared to K₀ and 26% less than the leaf area in K_M. The differences established in the size of leaf area by the differential supply of K at the tasseling stage were maintained at the silking stage.