GROWTH AND YIELD PERFORMANCE OF TWO MAIZE (*Zea mays* L.) VARIETIES UNDER DIFFERENT PHOSPHORUS LEVELS IN REDDISH BROWN EARTH SOIL

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Farmers prefer to cultivate both open-pollinated varieties (OPV) and hybrid maize especially in the dry zone of Sri Lanka. However, there are no separate fertilizer recommendations for OPV and hybrid varieties and hence they tend to apply different amounts of fertilizer without considering crop requirements. Nutrient requirements of a crop may be varied with the genotype. Hence, a pot experiment was conducted at Field Crops Research and Development Institute, Mahailluppallama, to study the growth and yield responses of OPV and hybrid maize under different phosphorus (P) levels in Reddish Brown Earth (RBE) soil. Six P levels; 0, 20, 40, 80, 160 and 320 mg/kg of soil were tested with Ruwan and Pacific maize varieties, using two factor factorial experiment of Complete Randomized Design with seven replicates. In this study, treatments and varieties were considered as factor one and two, respectively. Plant height, leaf area at flowering, biomass production at harvesting, total dry seed yield, number of seeds per cob and 100 seed weight were measured. Total tissue P content was measured at five weeks after planting by dry ash method. Results of the study showed that plant height, leaf area at flowering, number of seed per cobs, hundred seed weight, grain yield and biomass of both genotypes were increased with increasing levels of phosphorus up to 80 mg P/kg of soil. Beyond this level of P, growth and yield parameters decreased. No significant difference was observed among treatments or varieties in total biomass, total dry seed yield, plant height and seed weight. However, tissue P concentration increased with increasing levels of added phosphorus in both varieties. The study shows that the optimum P levels for Hybrid and OPV of maize is 80 mg/kg of soil (5 MT/ha) for RBE soil. Further field studies are needed to confirm the findings.

Keywords: Growth, Maize, Phosphorus, Reddish brown earth soils, Yield