ABSTRACT

Climate change due to global warming is contributing to upward shifts in temperatures and reductions in rainfall leading to increased incidences of soil moisture stress. A greenhouse experiment was conducted over two seasons to determine the effect of varying soil moisture regimes on root growth and nodulation of selected soybean (*Glycine max* (L.) Merrill) cultivars. The experiment was conducted as a Randomized Complete Block Design (RCBD) in a 4 x 6 factorial treatment arrangement with moisture regimes (80, 60, 40, and 20% of field capacity) as first factor and cultivars (Gazelle, Nyala, EAI 3600, DPSB 8, Hill, and DPSB 19) as second factor. Collected data on root diameter, root length, root surface area, root volume, and nodulation were subjected to Analysis of Variance (ANOVA) using Linear Mixed Model in GENSTAT. Significantly different treatment means were separated using Tukey's test at 0.05 level of significance. Moisture stress significantly reduced soybean root diameter, root length, root surface area, root volume, root biomass, root to shoot ratio, and nodulation of all tested cultivars. The degree of stress however varied with soybean cultivars tested with cultivar EAI 3600 having highest root volume, root biomass, and number of nodules per plant compared to other cultivars. Results suggest that 40% moisture at field capacity could be a threshold moisture stress level for soybean beyond which adaptive soil moisture mitigation practices like supplementary irrigation and use of appropriate agronomic practices be employed to improve soybean yields.