ABSTRACT

Despite Hungary's large cultivation of maize, average yield is low due to current climate challenges. For this reason, policymakers and practitioners recommend climate smart agriculture of which agroforestry is key. The study therefore seeks to assess the effect of irradiation on intercrop development in an agroforestry system involving maize and poplar trees. The study was conducted in Szarvas, Bekes County of Hungary from May 2022 to January 2023. A field measuring 100m × 10m in size was used with a row of poplar trees enclosing the field along the length of the field. Eight rows of maize plants were grown between the two rows of poplar trees with the first and the eighth rows being the closest to each row of the poplar trees. Data was collected on the plant height, number of plants, reflectance, transmittance, and absorbance on the field and biomass as well as starch, protein, and oil content of the kernels after harvest. Data collected were tested for their mean differences at 5% LSD. The study showed no significant difference ($p>0.05$) among the rows and tree interactions on the parameters taken. The rows closer to poplars had the highest number of plants with the highest heights. The rows in the middles of the field however recorded the highest above ground biomass weight. Four of the five indexes recorded from the spectrophotometer measurement however shows no significant differences between rows. The index that shows little significance between rows surprisingly reveals few significant correlations with the yield, weight, and starch content within the rows. From these findings, it can be concluded that poplar agroforestry system does not have a significant effect on plant height, aboveground biomass weight, and the nutrient content of the kernels with respect to irradiance received by the maize plants.