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Effect of maize-cowpea intercropping on light interception, yield and land use efficiency

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Two field experiments were conducted during summer seasons of 2013 and 2014 in a private farm Matai province, El Minia Governorate-Egypt. The objective of the experiments was to study the effect of maize intercropping with cowpea (*Vigna unguiculata* (L.) Walp) variety Keraim-1 on growth, light interception, yield and yield components as well as land use efficiency. Cowpea variety was intercropped with maize c.v. TH- 310 by alternation of 1,2 and 2 ridges of maize with 3,4 and 2 ridges of the legumes to form 1:3, 2:4 and 2:2 intercropping patterns. Additional plots of legumes and maize were grown at the solid recommended culture (solid I) and the comparative treatment where the same plant density adopted under intercropping (solid II). The data of light interception expressed as light energy flux density ($J\ m^{-2}\ s^{-2}$) showed reductions along the intercropped cowpea canopies at the different heights of measuring compared with the solid recommended cultures (SI and SII). The greatest reduction inside cowpea canopies occurred at 2:2 intercropping pattern. On contrast, reversible magnitude in light energy flux density was reported for the intercropped maize plants which were less competitive for light under intercropping than that in the solid cultures. Cowpea showed reductions in DM, number and weight of pods per plant, 100-seeds weight and seed yield per plant compared with the solid cultures. However, beneficial effects due to intercropping were reported for maize; i.e., number of ears/plant, number of grains/row and 100-grains weight. The relative yield increases per plant for maize were (67.6, 64 and 74.4%) for the intercropping patterns 1:3, 2:4 and 2:2 over the comparative treatment (Solid II). The data of the land equivalent ratio (LER) showed yield advantages due to intercropping by 12-14%. The highest LER value for maize-cowpea was reported with 2:4 intercropping pattern. It could be concluded from this study that maize-cowpea intercropping increase land use efficiency by 12-14% compared with each crop grown alone and 2:4 intercropping pattern is better than the other combinations.

Biography

Mostafa Abd El-Salam has completed his PhD from Field Crop Department, Cairo University and Postdoctoral studies from Field crop Research Department, National Research Centre. He is a Researcher of agronomy at National Research Centre; He has published more than 15 papers in reputed journals.

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