



Microenvironmental effects on potato and bean yields grown under intercropping system

SHARAIHA R.K., HADIDI N.A. - University of Jordan, Aman

This experiment was carried out at the Faculty of Agriculture Research Station – University of Mu'tah – during summer growing season of 2002, to evaluate the effect of the following micro environmental factors: light interception, air and soil heat unit, soil moisture storage (SMS), evapotranspiration (ET) and water use efficiency (WUE) on the yields of two potato varieties (Berca and Frisia) - *Solanum tuberosum* – and bean (local variety) – *Phaseolus vulgaris* – as they are grown under 1:2 and 2:2 intercropping row arrangement and sole cropping. In addition, land equivalent ratio (LER) was determined to assess the efficiency of intercropping system. The yields of the two potato varieties and bean were higher under intercropping than sole cropping, especially when they are grown under 2:2 row arrangement, where potato "Berca" and "Frisia" gave an increase in yield of 63.9%, and 70.7% respectively, while bean gave an increase in yield of 70.9%, and 57%, as it was grown with potato "Berca" and "Frisia" respectively, over the yields of their sole crops. The higher intercropped yields of the two potato varieties "Berca" and "Frisia" were associated with significant reductions in the values of light interception air and soil heat unit compared to the values obtained by the two potato varieties "Berca" and "Frisia" grown under sole cropping. On the contrary, the higher intercropped bean yield production was associated with significant higher values of light interception, air and soil heat unit as compared to the values obtained by bean sole crop. Additionally, the values of SMS and ET for potato and bean grown under intercropping tended to be lower than the values obtained by their sole crop. Moreover, WUE values of potato and bean grown in association were significantly higher than the values of WUE obtained by their sole crop. Further more, the values of total (LER) for potato and bean grown under intercropping were higher than one, which indicates the superiority of intercropping system over the sole cropping system. However, the highest total LER was obtained when both crops were grown under 2:2 intercropping row arrangement, where they gave an increase in the range of 64% to 67% as compared to sole cropping system.