

Effect of plant population and row orientation on crop yield under sorghum-cowpea intercropping systems in semi-arid Zimbabwe

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Abstract

Smallholder farmers commonly practise intercropping to improve crop yield per unit land area. Proper combination of plant population and row orientation of the component crops needs to be established and this prompted this investigation. A 2x7 factorial experiment was laid in a RCBD with three replications, at Matopos Research Station in Natural Region IV of Zimbabwe. Treatments consisted of sorghum planted at a constant population of 55556 plants/ha intercropped with cowpea (C) simultaneously planted at varying populations of 11111plants/ha (C1), 166667plants/ha (C3) and 222222plants/ha (C3) in East-West (EW) and North-South (NS) row orientation. Interaction of cowpea population density and row orientation significantly ($p < 0.05$) influenced crop yield and its attributes. Treatment NS- SC3 produced lowest number of pods/plant and grains/pod of 2.6 and 6.1 respectively. Highest cowpea grain yield (637.2kg/ha) was obtained in EW-C3 and lowest (92.4kg/ha) in EW-SC3. Sorghum yield was highest in NS-S (1296.5kg/ha) and lowest in EW-SC3 (491.9kg/ha). LER showed that intercropping performed better than sole crops except for EW-SC3 and NS-SC3 which had LER of 0.800 and 0.905 respectively. Highest LER of 1.312 was obtained in EW-C2. Farmers should plant sorghum-cowpea intercrops in EW row orientation for increased cowpea grain yield but NS row orientation for sole sorghum.

Keywords: Intercropping, Intercrop population, Row orientation, LER