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Full Length Research Paper

Effect of maize planting density on the performance of maize/soybean intercropping system in a guinea savannah agroecosystem

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Abstract

Two field experiments were conducted during the 2004 early and late seasons at the Agricultural Vocational Training Centre, Otobi, Otukpo in the southern guinea savanna agro-ecological zone of Nigeria to evaluate the effects of maize planting density (38,000; 44,440 and 53,330 plants/ha) in intercrop with soybean varieties (TGX 1448-2E and Samsoy-2) on the growth, yield and productivity of the maize/soybean intercropping system. The soybean varieties were maintained at the optimum planting density of 266,660/ha in both sole and intercrops while sole maize (TZR-EW) plots were at the recommended planting density of 53,330 plants/ha. Samsoy -2 soybean plants were taller at the various ages of growth, had more leaves and attained 50% flowering earlier, produced more and heavier nodules than TGX 1448-2E but TGX 1448-2E produced significantly ($P < 0.01$) more pods and higher seed yield in both seasons. Intercropping reduced the number of soybean pods per plant by 46% in the early season and seed yield by 42 and 46% in the early and late seasons, respectively. Increasing maize planting density reduced soybean seed yield by 21 and 23% at maize planting density of 44,440 and 53,330 plants/ha, respectively, compared with intercropping at 38,000 maize plants/ha. Maize plant height and leaf production were not influenced by intercropping nor by maize planting density but in the late season, maize grain yield was highest with 53,330 maize density/TGX 1448-2E but lowest with 38,000 maize density/Samsoy-2 cropping. The productivity of the intercropping system indicated yield advantage of 2-63% as depicted by the LER Of 1.02-1.63 showing efficient utilization of land resource by growing the crops together and this increased with maize planting density. The total monetary return was higher for the intercrops than the sole crops with the values highest with 53,330 maize density/TGX 1448-2E in both early (N293,171.80) and late (283,069.70)

seasons. The implication of this is that farmers in the study area would earn more income growing the crops together.

Key words: Maize planting density, soybean, intercropping, land equivalent ratio, monetary return.

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