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Residual Effect of Composted Farmyard Manure on Sorghum Growth and Yield

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Abstract

In Sudan *Sorghum bicolor* L. (Moench) is a staple food crop for more than 75 % of the population. It is annually grown on 6 million ha with an average grain yield hardly exceeding 0.5 t ha^{-1}. At the farm level, sorghum straw is used as animal fodder and fertilisers (synthetic or organic) are rarely used for this crop.

The experiment described here was conducted at the Gezira Research Farm in Wad Medani, Sudan, during the two seasons 2002 and 2003, to investigate the residual effect of farmyard manure (FYM) after application to muskmelon (*Cucumis melo* ssp melo var. reticulatus, "Gallia") on grain and stover yield of *S. bicolor*), variety Tabat. The experimental site in Gezira is characterised by a pH (water) of 8.2, an ECe of 0.4 dS m^{-1} and an ESP of 11.1. It is a very heavy soil containing 0.3 % of organic matter, 59 % of clay, 29 % of silt and 12 % of sand, which is the reason for its low hydraulic conductivity of 0.9 cm h^{-1}. The experiment was laid out in a randomised complete block design replicated three times, with harvest areas of 4 m × 5 m. Treatments were 0, 2.5, 5 and 7.5 t of composted FYM ha^{-1} which were incorporated on ridges with distances of 80 cm for the preceding crop muskmelon. During both seasons, sorghum was sown mid July at 20 cm intra row spacing and thinned to 2 seedlings per hill at 3 weeks after emergence. Urea was split applied at 84 kg N ha^{-1}, the first half after thinning and the second one month later.

The combined result of the two years showed that the FYM increased sorghum yield parameters: At 5 t FYM ha^{-1}, sorghum grain yield increased by 16 % and grain number per unit area by 20 %. At 7.5 t FYM ha^{-1}, biomass of sorghum increased by 19 %. Harvest index, number of days to 50 % flowering, plant height, panicle length and 100 grain mass were not affected. The positive influences of FYM are probably due to improved physical soil conditions (e.g. better permeability) of this heavy soil.

Keywords: Farmyard manure, muskmelon, sorghum, Sudan

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