



## Research paper

# Effect of Different Fertilizers on Yield and Yield Components of Chickpea (*Cicer arietinum* L) on High Terrace Soil in the River Nile State, Sudan

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## ABSTRACT

This study aimed to increase chickpea production in the River Nile State- Sudan by using different fertilizers in high terrace soil. A randomized complete block using split plot arrangement was used to layout the experiment. The treatments consisted of five fertilizers compilation Di-Amino-Phosphate (DAP) and compost. The levels were: control, 1DAP, 2DAP, 1DAP plus compost, and 2DAPplus compost. However, compost fertilizer was applied at rate of about 3.3 MT ha<sup>-1</sup>; one compost sack is equivalent to 100 kg of organic material, and 1DAP= 92.8 kg ha<sup>-1</sup> while 2DAP= 185.6 kg ha<sup>-1</sup> of N. Two local chickpea varieties Atmour and Borgag were tested. The treatments were arranged in split plot design with four replicates. Planting was on ridges 60cm apart and in-row spacing 10cm with 2 seeds per hole. Plot size was (6m x 6m). Sowing was on mid of November each season and irrigation was carried out every 7 days regularly. The results showed highly significant differences in plant height and number of pods per plant in both varieties Atmour and Borgeig. The highest plant height and number of pods per plant were observed when compost plus 2DAP was applied. Number of branches per plant was increased significantly with application of 2DAP. Both compost and DAP fertilizers had significant effect on 100 seed weight and the best 100 seed weight was achieved by application of compost plus 2DAP. The application of compost plus 2DAP significantly increased yield by 54 and 45% for both varieties Atmour and Borgeig in the first season. In the one hand, the increases in the second season was 69 and 67%. The maximum biological yield was attained by the treatment of compost plus 2DAP. The application of compost plus 2DAP has an economical benefit to farmers if they used the recommended packages, it realized Marginal rate of return (MRR) equals to about 2361%.

**Keywords:** Atmour, Borgeig, di-amino phosphate, compost.