

Research Paper :

Influence of organics and levels of NPK on yield and major nutrients uptake of groundnut in coastal sandy soil

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ABSTRACT

A field experiment was conducted in a farmer's field at Ponnanthittu coastal village, near Chidambaram during Dec - Mar 2006, to find out the influence of organics and NPK levels on the yield and nutrient uptake by groundnut in coastal sandy soil. Texturally, the experimental soil was sandy with initial soil characteristics (0-15 cm layer) of the experimental site were, pH-8.39 and EC-1.61dS mol. The soil registered low organic carbon status of 0.27 %, 128.32 kg ha⁻¹ of alkaline KMnO₄ - N; 10.23 kg ha⁻¹ of Olsen-P and 196.74 kg ha⁻¹ of NH₄OAc-K, respectively. The treatments consisted of different levels of NPK viz., A₁-Control; A₂-100% NPK; A₃-125% NPK and A₄-150% NPK as factor A and different sources of organics viz., B₁-Control, B₂-Composted coirpith @ 12.5 t ha⁻¹ and B₃-Pressmud @ 12.5 t ha⁻¹ as factor B. The above treatments were arranged in a Factorial Randomized Block Design (FRBD) with three replications and tested with groundnut var. VRI 2. The results of the study indicated that the combined application of 150% NPK along with composted coirpith @ 12.5 t ha⁻¹ was significantly superior in increasing the yield and nutrients uptake by groundnut.

Key words : Coastal sandy soils, Organics, Yield, Nutrient uptake, Groundnut

The coastal sandy soils have specific soil constraints viz., light texture, poor exchange property, nutrient and water retention capacity, low status of organic carbon deficiency of nutrients etc. These problems severely affect the productivity of crops in this region. Even the applied nutrients, due to poor physical and exchange characteristics are leached. This necessitates the increased rate of nutrients application especially NPK in such soil. The addition of organics in sandy soil improves the organic carbon status, the retention and availability of applied nutrients (Badanur *et al.*, 1990 and Khar, 1993). Hence, in the present investigation, an attempt has been made to study the influence of organics with NPK levels on the nutrient uptake and yield of groundnut in coastal sandy soils.

MATERIALS AND METHODS

A field experiment was conducted in a farmer's field in Ponnanthittu village during December-March 2006. The initial soil of the experimental site had a pH-8.39 and EC-1.61dS mol. The soil was low in organic carbon (0.27%), low in available N (128.3 kg ha⁻¹), P (10.23 kg ha⁻¹) and medium in available K (196.7 kg ha⁻¹). Four levels of NPK viz., A₁- Control, A₂- 100% NPK, A₃- 125% NPK and A₄-150% NPK were used as treatments in main plots. Different sources of organics viz., B₁- Control, B₂- Composted coirpith @ 12.5 t ha⁻¹ and B₃- Pressmud @ 12.5 t ha⁻¹ were used as treatments in sub plots. The

experiment was laid out in a Factorial Randomized Block Design (FRBD) with three replications, using groundnut var. VRI 2. A fertilizer dose of 17 kg of N + 34 kg of P₂O₅ + 54 kg of K₂O per hectare for groundnut was applied as urea, single super phosphate and muriate of potash, respectively. Required quantities of different organics and fertilizers as per the treatments schedule were incorporated. The plant samples were collected at critical stages of groundnut viz., flowering, peg formation and at harvest stages and analyzed for the concentration of nutrients like N, P and K were estimated using the standard procedure as outlined by Jackson (1973) and uptake were calculated. At harvest pod and haulm yield were recorded.

RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

Yield:

A profound influence of inorganic and organics in increasing the pod and haulm yield of groundnut was well evidenced in the present study. Among the NPK levels, application of 150 per cent NPK(A₄) was significantly superior by recording 2052 kg ha⁻¹ of pod and 2776 kg ha⁻¹ of haulm yield, respectively (Table 1). Among the organics the effect due to the application of composted coirpith was superior followed by the application of PM @ 12.5 t ha⁻¹.