

Research Paper :

Changes in availability of NPK and S as influenced by incorporation of organic amendment Purna-11 in vertisol

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ABSTRACT

A field experiment was conducted on clayey soil (Typic chromustert) to study the effect of organic amendment Purna-11 with and without fertilizers on NPK balance in soil. Application of organic amendment Purna-11 have positive effect on availability of nutrients in soil. Nitrogen, Phosphorus and sulphur status of soil increased significantly with the application of Purna-11 @ 150 kg ha⁻¹ with 100 per cent RDF . In case of potassium an application of FYM @ 10 t ha⁻¹ recorded significantly higher availability in soil followed by application of Purna-11 @ 150 kg ha⁻¹.

Key words : Organic amendment, NPK availability, S availability

The continuous use of chemical fertilizers increased the crop yield in initial years and adversely affected stability at a later stage (Virmani, 1994). The toxicity due to addition of salt through chemical fertilizers deteriorates physical and chemical properties of soil, which are important factors for plant growth and survival (Anand and Yaduvanshi, 2000). During green revolution, introduction of high technology agriculture restricted the use of organic manure have lead to depletion of organic matter and thereby decreased the suitability of land for crop. Organic amendments not only supply the nutrients for crop growth but also improve the physical and chemical properties of soil. (Appava *et al.*, 2000). Organic amendments offer best possible means of restoring and maintaining the productivity of agricultural soil. So the present investigation was carried out to study the effect of organic amendment Purna-11 on nutrient availability (NPK and S) with Soybean as test crop.

MATERIALS AND METHODS

The present field experiment was conducted in vertisol on soybean (MAUS-81) during *khari*, 2004 to study contribution of organic amendment Purna-11 on availability of NPK and S. Nine treatments *viz.*, T₁-control, T₂-100 per cent RDF (30:60: 30 kg ha⁻¹ NPK), T₃ -100 per cent RDF + Purna-11 @ 150 kg ha⁻¹ , T₄- 50 per cent RDF + Purna-11 @ 300 kg ha⁻¹, T₅- 50 per cent RDF + Purna-11 @ 600 kg ha⁻¹ , T₆-Purna-11 @ 300 kg ha⁻¹, T₇-Purna-11 @ 600 kg ha⁻¹, T₈- Purna-11 @ 900 kg ha⁻¹ and T₉- FYM @ 10 t ha⁻¹ were set in randomized block design with three replications. Organic amendment Purna-11 (0.35 per cent N, 0.14 per cent P, 0.11 per cent

K) and farm yard manure (0.6 per cent N, 0.12 per cent P, 0.83 per cent K) were incorporated in to the concerned treatments three weeks before sowing. Recommended dose of fertilizers were applied before sowing. Urea, SSP and MOP were used to meet out the requirement of chemical fertilizes. The initial characteristics of experimental soil which is clayey in texture (Typic chromustert) are; pH 8.26, E.C. 0.68 dSm⁻¹, organic carbon (OC) 27.2 g kg⁻¹ and available nitrogen, available phosphorus and available potassium were 89.7, 27.8 and 415.2 kg ha⁻¹, respectively. After harvesting of soybean surface (0-15 cm depth) soil samples were collected and analyzed for chemical properties like available nitrogen, available phosphorus, available potassium and available sulphur (Jackson, 1967).

RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

Available nitrogen :

Available nitrogen content (Table 1) of surface soil at different critical stages of soybean differed significantly with the application organic amendment with fertilizer over control. Significantly higher available nitrogen in surface soil was recorded with the application of Purna-11 @ 150 kg ha⁻¹ along with 100 per cent RDF at flowering, pod formation and harvesting stages of soybean. Increase in available nitrogen with organic amendment may be due to the direct addition of nitrogen through Purna-11 to the available pool of soil. In all the critical growth stages, incorporation of Purna-11 @ 150 kg ha⁻¹ with 100 per cent