

Full Length Research Article

Land Productivity Enhancement and Soil Health Improvement in Groundnut

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Abstract: The field experiment was conducted during summer season of 2010 at farmers field at Vrindhachalam. To study the response of groundnut crop to integrated nutrient management techniques. The results shows that application of 100% recommended dose of fertilizer along with enriched farmyard manure and zinc sulphate @ 25 kg registered the highest yield components in groundnut crop compared with other treatments.

Key words: Groundnut, Gypsum, Enriched farmyard manure, yield components.

INTRODUCTION

Groundnut is one of the important major oilseed crop in India. Although India ranks first in the world in respect of area and production, However, ranks 9th in productivity (Soanwane *et al.*, 2010). It is valuable cash crop planted by millions of small farmers because of its economic and nutritional value. Groundnut which helps to enrich the soil nitrogen and ultimately maintain soil health. Its kernels are rich source of edible oil and protein. It contains on an average 45 – 50% oil, 25-30% protein, 20% carbohydrate, 5% fibre and ash and is a rich source of Ca, Fe, Vitamins A,B,E and K, which make a substantial contribution to human nutrition. Groundnut is essentially tropical crop. It requires long and warm growing season. The most favourable climatic conditions for groundnut are a well distributed rainfall of at least 50cm during treeing season. In India, groundnut is cultivated in 5-48m ha with a production of 5-43 mt and productivity of 99/kg ha⁻¹. Tamilnadu ranks third in the country both in area (6.03 lakh ha⁻¹) and production (9.89 mt) contributing with an average productivity of 1.64 t ha⁻¹ (Directorate of economics and statistics, Department of Agriculture and Co-operation). The low level of its productivity has been ascribed to several constraints. Among them, low organic matter content, pot fertility status, imbalanced use of high analysis chemical fertilizers accompanied by restricted use of organic manures that made the soils not only deficient in secondary and micronutrients, but also deteriorated the soil health (Akbari *et al.*, 2011). Due to continuous application of chemical fertilizers were lead to soil hazardous. Hence, it is necessary to integrate different sources of nutrients to meet the crop requirement. Sustainable yields in groundnut can be achieved through the conjunctive use of organic and inorganic fertilizers (Singh *et al.*, 1990). Organic manures improved the soil, physical chemical and biological. Properties and also increase the efficiency of the applied nutrients (Pandey *et al.*, 2000) keep these view of above, a field experiment was carried out to study the response of groundnut to integrated nutrient management.

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MATERIALS AND METHODS

A field experiment was conducted at experimental farm at farmers, field at Vrindhachalam during summer season of 2010. The soil was clay 100m in texture and pH of 7.1. The soil of the experimental site was low in available N (272 kg ha⁻¹), high in available P₂O₅ (65 kg ha⁻¹) and K₂O (478 kg ha⁻¹). The treatment comprised combination of organic and inorganic fertilizers. The treatments were arranged in randomised block design and replicated thrice. The recommended dose of fertilizer were Kg, N, P₂O₅ and K₂O / ha. The crop was sown in summer 2011. A spacing of 60 × 30 cm was adopted. Full dose of P and K along with help of N as per the treatment was applied as basal and the remaining half of N was top dressed at 35 days after sowing. Standard package of practices were followed in raising the crop. The crop was raised under irrigated condition. Data on seed yield was recorded after harvest and expressed on air dry basis. The retreatment schedule of experiment field as follows: T₁ – Control, T₂ – RDF (30:60:30 NPK kg ha⁻¹), T₃ – RDF + Zn So₄ @25 kg, T₄ – RDF + EFYM @ 750 kg ha⁻¹, T₅ – RDF + EFYM @ 750 kg ha⁻¹ + ZnSo₄ @ 25kg ha⁻¹, T₆ – 50% RDF + EPYM @ 750 kg ha⁻¹, T₇ – 50% RDF + ZnSo₄ @ 25kg + EFYM @ 750 kg ha⁻¹, T₈ – 100% RDF + Gypsum @ 500 kg ha⁻¹ + EFYM @ 750 kg ha⁻¹, T₉ – 100% RDF + Mgso₄ @ 15 kg ha⁻¹ + EFYM @ 750 kg ha⁻¹, T₁₀ – 100% RDF + Gypsum @ 500 kg ha⁻¹ + MgSo₄ @ 15 kg ha⁻¹ + EFYM @ 750 kg ha⁻¹

RESULTS AND DISCUSSION

No. of Pods Plant⁻¹ : The effect of different treatments on no. of pods Plant⁻¹ is presented in Table 1. The highest no. of Pods plant⁻¹ was observed in 100% recommended dose of fertilizer along with enriched farm yard manure and zinc sulphate @ 25 kg. Followed by 50% RDF + ZnSo₄ @ 25kg + EFYM @ 750 kg ha⁻¹. The minimum no. of pods plant was recorded under control plot. Similar results was reported by Guniri and Nath 2012.

Test Weight: The maximum test weight was recorded of groundnut seeds was recorded in treatment application of

100% recommended dose of fertilizer along with enriched farmyard manure and zinc sulphate @ 25kg followed by 50% RDF + ZnSo₄ @ 25kg + EFYM @ 750 Kg ha⁻¹.

Treatment	Pod/ Plant	100 grain weight	Pod yield (kg ha ⁻¹)	Haulm Yield (kg ha ⁻¹)	Oil Content (%)
T ₁	13.32	30.29	1012	1772.00	45.68
T ₂	15.61	31.88	1714	2796.00	47.24
T ₃	17.26	32.09	1874	2694.00	47.69
T ₄	14.53	31.24	18888	2534.00	47.23
T ₅	17.82	37.29	2742	3296.00	49.69
T ₆	13.17	29.69	1809	2474.00	46.54
T ₇	16.53	34.32	2028	3206.00	49.01
T ₈	13.29	30.03	1914	2629.00	47.29
S.Ed	2.81	1.07	150.12	104.05	0.93
CD (p = 0.05)	5.79	2.15	251.25	208.10	1.87

Pod Yield: The effects of different levels of fertilizers and manures on pod yield of groundnut were found significant (Table 1). The maximum pod yield, Haulm yield, and oil content were recorded with 100% RDF + EFYM @ 750kg ha⁻¹ + ZnSo₄ @ 25 kg ha⁻¹. It may be due to application inorganic fertilizer with organic sources is known to reduced the C: N ratio and stimulate the mineralization of organic N that in turn resulted in higher yields similar results were reported by Badole *et al* (2004). Laxminarayana and Patriam (2005), Panwar and Munda (2007) and Basu *et al* (2008) and Singh *et al* (2011), Akbari *et al* 2011 and Mohapatra, A. K. B and Dixit 2010.

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