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Effect of organic manure and biofertilizers on yield, harvest index, shelling percentage and quality of *kharif* groundnut (*Arachis hypogeae* L.)

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ABSTRACT

Field experiment was conducted during the *kharif* season of 2006-07 at Junagadh (Gujarat) to study the response of organic manure and biofertilizers (Rhizobium+PSM) in clayey soils on groundnut (*Arachis hypogeae* L.). The results revealed that seed inoculation with biofertilizers (Rhizobium+PSM) significantly increased the pod, haulm and biological yields, shelling percentage, oil yield and protein content of groundnut crop over control (no manuring). The crop responded favourably to application of 6 t/ha and 3 t/ha FYM along with Rhizobium+PSM and gave significantly pod, haulm, biological yields, shelling percentage, oil yield and protein content of groundnut over no manuring. Harvest index and oil content was not influenced significantly due to application of organic manure alongwith biofertiizers (Rhizobium+PSM) in groundnut.

Key words : Groundnut, Organic maure, Bioferilizers, Yield, Quality

INTRODUCTION

Among the oilseed crop grown in India, groundnut occupies pre-dominant position. It has now not retained only as as important edible oilseed, but also gained prominence as an important cash crop and foreign exchange earner for India in general and for Gujarat in particular. Therefore, the groundnut is rightly called as "King of oilseed" in India. Groundnut seed contains about 50% of the seed has high qualities of protein (21.4-36.4%), carbohydrates (6.0-24.09%), minerals and vitamins. (Das, 1997).

Biofertilizers like Rhizobium and PSM are microbial inoculants of selective microorganisms like bacteria, algae, fungi already existing in nature. They may help in improving soil fertility by way of accelerating biological nitrogen fixation from atmosphere. Solubilization of the insoluble nutrients already present in soil, decomposing plant residues, stimulating plant quality and production.

An organic fertilizer has nitrogen, phosphorus, potassium, organic carbon, sulphur, hormones, vitamins, enzymes and antibiotics which helps to improve the quality and quantity of yield. Organic fertilizers like FYM, vermicompost, castor cake etc. with biofertilizers should be apllied to obtain desirable yields and improvement in quality parameters. Keeping these objectives in mind, an experiment was conducted to find out level of organic manures with and without biofertilizers for maximizing yield and quality parameters of groundnut crop.

MATERIALS AND METHODS

An investigation was conducted at Instructional Farm, Junagadh Agricultural University, Junagadh during the *kharif* season of 2006-07. The soil of the experimental plot was clayey in texture and slightly alkaline in reaction. The soil has average organic carbon content of 0.81 per cent and was high in available nitrogen and medium in available phosphorus and potash with pH 7.9.

The experiment was laid out in randomized block design with twelve treatment combinations. These treatments are as follows : T_1= Control, T_2= 100% RDF (12.5:25:0 NPK/ha), T_3= Rhizobium+PSM, T_4= FYM@ 6.0 t/ha, T_5= Castor cake@ 1000 kg/ha, T_6= Vermicompost@ 2.0 t/ha, T_7= FYM@ 6.0 t/ha+ Rhizobium+PSM, T_8= Castor cake@ 1000 kg/ha+ Rhizobium+PSM, T_9= Vermicompost@ 2.0 t/ha+ Rhizobium+PSM, T_{10}= FYM@ 3.0 t/ha+ Rhizobium+ PSM, T_{11}= Castor cake@ 500 kg/ha+Rhizobium+PSM, T_{12}= Vermicompost@ 1.0 t/ha+ Rhizobium+PSM.

An improved variety, GujaratGroundnut-20 (GG-20) was used in this investigation. GG-20 variety of groundnut was sown in second week of July with 60 cm x 10-15 cm spacing with 100 kg/ha seedrate. The crop was fertilized as per treatments at the time of sowing. Groundnut seed was inoculated with a culture of Rhizobium plus PSM as per treatments before sowing. Other cultural and intercultural operations were done as per recommendation and crop requirements. During crop growth period about 1004.5 mm rainfall was received in 44 rainy days. Finally the crop was harvested and produce were dried, threshed, cleaned and weighed. The yield data was subjected to statistical analysis. An oil and protein content of kernel was determined by Nuclear Magnetic Resonance (NMR) as per method suggested by Tiwari *et al*. (1974). The oil yield (kg/ha) was calculated from the oil content and pod yield.

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