

Effect of organic manure and biofertilizers on growth and yield attributing characters of *kharif* groundnut (*Arachis hypogaea* L.)

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ABSTRACT

An experiment was conducted during the *kharif* season of 2006-07 at Junagadh (Gujarat) to study the effect of organic manure with and without biofertilizers on growth, nodulation and yield of groundnut (*Arachis hypogaea* L.). Seed inoculation with biofertilizers (Rhizobium+PSM) significantly increased the plant height, nodules per plant, yield attributing characters and yield of groundnut. Manuring the crop with FYM 6 t/ha+Rhizobium+PSM gave significantly 40.19 and 35.96 per cent higher pod and haulm yields of groundnut, respectively over no manuring. Fertilizing the crop with vermicompost 2.0 t/ha+Rhizobium+PSM and FYM 3.0 t/ha+Rhizobium+PSM found equally effective and significantly superior to control in respect to growth parameters, yield attributes and yield of groundnut.

Key words : Groundnut, Organic manure, Biofertilizers, Growth, Nodulation, Yield

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is a major commercial oilseed crop in India, China, Brazil, Nigeria and USA. Among the oilseed crop grown in India, groundnut occupies pre-dominant position. In recent years, crop cultivation requires the use of chemical fertilizer, but it is expensive for people who have not capacity to buy fertilizer. Therefore, the current trend is to explore the possibilities of supplementing organic fertilizer like FYM, castor cake, vermicompost etc. with biofertilizers. Biofertilizers have shown positive interaction with organic manure in legume crops. Organic manure in conjunction with biofertilizers will sustain and maintain the productivity of soil. Therefore, it is needed to compare various organic manure with biofertilizers in order to find out most effective combination. Keeping this objective in view, the present investigation was conducted to study the effect of organic manure and biofertilizers on growth and yield of groundnut.

MATERIALS AND METHODS

An investigation was carried out at Instructional Farm, Junagadh Agricultural University, Junagadh during the *kharif* season of 2006-07. The soil of the experimental plot was clayey in texture having pH 7.9, high in available nitrogen and medium in available phosphorus and potash. The experiment was laid out in randomized block design with twelve treatment combinations which are as follows: T₁= Control, T₂= 100% RDF (12.5:25:0 NPK/ha), T₃= Rhizobium+PSM, T₄= FYM@ 6.0 t/ha, T₅= Castor cake@ 1000 kg/ha, T₆= Vermicompost@ 2.0 t/ha, T₇= FYM@ 6.0 t/ha+ Rhizobium+PSM, T₈= Castor cake@

1000 kg/ha+ Rhizobium+PSM, T₉= Vermicompost@ 2.0 t/ha+ Rhizobium+PSM, T₁₀= FYM@ 3.0 t/ha+ Rhizobium+PSM, T₁₁= Castor cake@ 500 kg/ha+Rhizobium+PSM, T₁₂=Vermicompost@ 1.0 t/ha+ Rhizobium+PSM

Groundnut cv. GG-20 was sown at 60 cm x 10-15 cm spacing with 100 kg seed/ha in second week of July. The recommended dose of fertilizers @ 12.5:25:0 kg NPK/ha was considered as 100% RDF. The crop was fertilized as per treatments at the time of sowing, while well decomposed FYM containing 0.5% N, 0.2% P₂O₅, and 0.5% K₂O was mixed with soil at preparation of soil. Seed was inoculated with a culture of Rhizobium plus PSM as per treatment before sowing. Other cultural 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.

RESULTS AND DISCUSSION

Effect of organic manure:

Groundnut crop manured with FYM 6.0 t/ha and vermicompost 2.0 t/ha significantly increased the growth parameters *viz.*, plant height and number of nodules per plant (Table 1) at harvest as well as yield attributes like number of pods per plant, weight of pods per plant at harvest, number of mature pods per plant and seed index as compared to control (without organic manure) (Table 2). This may be due to the fact that organic manure increases the adsorptive power of soil for cation and anion