

## **Integrated nutrient management in green gram (*Phaseolus radiatus*) – Indian mustard (*Brassica juncea*) - summer groundnut (*Arachis hypogaea*) cropping system**

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### **ABSTRACT**

A field experiment was carried out for two consecutive years during 1998-99 and 1999-2000 at Zonal Agriculture Research Station, Mainpuri, C.S.Azad University of Agriculture and Technology, Kanpur. The main objective was to popularize the summer groundnut cultivation in multiple cropping of green gram-mustard-summer groundnut on nutrient deficient soil. Results display that the application of 20 kg N + 50 kg P<sub>2</sub>O<sub>5</sub> in combination of FYM @ 10 t ha<sup>-1</sup> registered significantly higher growth, yield components and grain yield of green gram (5.29 q ha<sup>-1</sup>) over control and conventional system of R.D.F. Likewise, the integration of residue of FYM @ 10 t ha<sup>-1</sup> with 120 kg N + 40 kg P<sub>2</sub>O<sub>5</sub> + 40 kg K<sub>2</sub>O ha<sup>-1</sup> pushed up significantly to growth and yield traits of mustard which culminated into significant increase in seed yield of mustard (24.48 q ha<sup>-1</sup>). Application of 15 kg N + 30 kg P<sub>2</sub>O<sub>5</sub> + 45 kg K<sub>2</sub>O ha<sup>-1</sup> in conjunction with remaining residue of 10 t FYM ha<sup>-1</sup> gave significantly higher pod yield of summer groundnut by 22.21 q ha<sup>-1</sup> over control and conventional system of RDF. The growth and yield contributing characters noted in groundnut were concordant to the pod yield of groundnut. The uptake of NPK was increased under different crops of cropping system, when fertilized with RDF in association of FYM. Analysis of soil after harvesting of different crops of the sequence showed a significant build up of NPK with the application of FYM. The population of earthworms was higher in the soil receiving plenty of FYM, inoculated with vermi compost.

**Key words :** Soil biodiversity, Multiple cropping, Inoculation, Nutrient biocycle and Vermi compost.

### **INTRODUCTION**

Application of FYM in multiple cropping is a holistic nutrients management system, which promotes and improves the health of the agro system related to biodiversity, nutrient bio cycles and soil microbial and biochemical activities. The conventional agriculture is heavily dependent on non-renewable resources viz., chemical fertilizers and pesticides. The excessive and imbalanced use of agro-chemicals on soil and plant is not only damaging the soil biodiversity i.e. bacteria, fungi, actinomycetes etc. but also reduces the productivity potential of the farmland. Conventional intensive agriculture causes several problems as depletion of soil organic matter and plant nutrients besides occurrences of pest and diseases. The nutrients present in the FYM are dissolved easily in water and quickly find their way in soil, water bodies and food chains. The soil is a living dynamic system and biodiversity is adversely affected if soil is not amended with organic manure at regular intervals to feed the soil biota.

Multiple cropping system is the most common and widely adopted system throughout the Indo-Gangetic plains of Uttar Pradesh. This cropping system is the major

consumer of chemical fertilizers and pesticides but the trend of fertilizer use efficiency is not encouraging. The balanced use of plant nutrients is needed for normal optimum growth of plants in multiple cropping. The requirements and the balanced use of plant nutrients cannot be only met by use of chemical fertilizers alone but more advantageously by different methods of organic recycling and large-scale use of renewable organic resources.

With the view to increase the productivity of green gram during rainy season, mustard during winter season and groundnut during summer season under multiple cropping, popularized the groundnut cultivation during summer season and to enrich the nutrients deficient soil, the present experiment was planned and executed under integrated nutrient management.

### **MATERIALS AND METHODS**

The experiment was carried out for two consecutive years during 1998-99 and 1999-2000 at Zonal Agriculture Research Station, Mainpuri, C. S. Azad University of Agriculture & Technology, Kanpur. The soil of the experimental site was sandy loam in texture having pH