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Effect of INM practices on yield, quality and economics of Pigeonpea (*Cajanus cajan* L. Millsp.) under rainfeed conditions

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ABSTRACT

A field experiment was conducted during the *kharif* season of 2001-02 to study the response of pigeonpea (*Cajanus cajan* L. Millsp.) to integrated nutriment management in clayey soils of Gujarat. The results revealed that seed inoculation with biofertilizers significantly increased the growth, yield, protein content and monetary returns of pigeonpea crop. The crop responded favourably to application of FYM 5 t ha^{-1} and gave significantly higher grain yield, protein yield and net returns over no manuring. A significant increasing in yield, protein content and protein yield was noted with each increment of fertilizer dose up to 100 % recommended dose. Fertilizing the crop with 100 % RDF ha^{-1} gave the highest net realization of Rs. 14854 ha^{-1}, however the highest net ICBR of 1:3.2 was secured with 75 % RDF ha^{-1}.

Key words: Pigeonpea, INM, Yield,Quality,Economics

INTRODUCTION

Pigeonpea (*Cajanus cajan* L. Millsp.) is one of the major pulse crop of India but has poor productivity of 720 kg ha^{-1} against the potential of 3000 kg ha^{-1} as recorded in different parts of the country. The low yield of pigeonpea is not only due to its cultivation on sub marginal lands, but also due to poor level of nutrient management. To overcome this problem, soil has to be fortified with different sources of nutrients. In this context, use of biofertilizers occupy an important place as they help in making available plant nutrients by fixing nitrogen and solubilization of phosphate, thus providing a scope for reduction in costly chemical fertilizers. The use of organic material in crop production is receiving attention worldwide. Total reliance on such materials alone, however, is unrealistic and mineral fertilizers in conjunction with organic fertilizers should be applied to obtain desirable yields. Inorganic fertilizers though support plant growth and increase yield, but in long run, they affect the soil biota and make soil infertile due to leaching, change in pH etc. Keeping this view in mind, an experiment was conducted to find out level of substitution of inorganic fertilizers with and without organic and biofertilizers for maximizing yield, quality and monetary returns of pigeonpea crop.

MATERIALS AND METHODS

An experiment was conducted at Instructional Farm, Junagadh Agricultural University, Junagadh during the *kharif* season of 2001-02. The experimental soil was clayey in texture, medium in total nitrogen and available phosphorus and high in available potassium with pH 7.7. The experiment was laid out in factorial randomized block design with sixteen treatment combinations involving two levels of Biofertilizers (with and without seed inoculation of *Rhizobium* plus *Pseudomonas striata*), two levels of FYM (with and without 5 ton FYMha^{-1}) and four levels of Recommended dose of fertilizers (0, 50, 75 and 100 % RDFha^{-1}) with four replications. Pigeonpea Cv. GT-1 was sown at 90cm x 20cm spacing with 15 kg seed/ha in first week of July. The recommended dose of fertilizers @ 25:50:0 kg N:P:Kha^{-1} was considered as 100% RDF. The crop was fertilized as per treatments with application of urea and diammonium phosphate at the time of sowing, while well decomposed FYM containing 0.5 % N,0.2% P_2O_5 and 0.5 % K_2O was applied 10 days prior to sowing as per treatments. Seed was inoculated with a culture of *Rhizobium* plus *Pseudomonas striata* as per treatments before sowing. Other cultural operations were done as per recommendation and crop requirements. During crop growth period about 547.3 mm rainfall was received in 41 rainy days. Two supplementary irrigations were given during the crop period. The protein content in grain was calculated by multiplying n content of seed with the factor 6.25 (Gassi *et al.* 1973) . Modified Kjeldhal's method and vanodomolybdo-phosphoric acid yellow colour method was adopted to find out N and P content in grains respectively (Jackson 1967). The protein yield (kg ha^{-1}) was calculated from the protein content and the grain yield.

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