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Effect of integrated nutrient management on cowpea

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Abstract : A field experiment was conducted during 2010-11 at the field of Horticulture farm, Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (Maharashtra) to evaluate the effect of 16 treatments *i.e.* various sources of nutrient on growth parameter, yield attributes, nutrient uptake, and soil nutrient status of cowpea (*Vigna unguiculata* L.) variety 'pusa komol'. As regards the growth parameters the plant height, number of leaves and branches per plant were significantly increased to a greater extent by the treatment 75 per cent RDF + Vermicompost + *Rhizobium* + PSB as compared to RDF alone. In respect of yield per hectare and over all yield contributing factors, such as number of pods, diameter and length of pods, the treatment of 75 per cent RDF + Vermicompost + *Rhizobium* + PSB was found significant over control and RDF alone. It indicates a saving of 25 per cent chemical fertilizer. Nitrogen status in soil after harvest was found significant in treatment RDF + *Rhizobium* + PSB and phosphorus status in soil after harvest was found significant in treatment 75 per cent RDF + vermicompost + *Rhizobium* + PSB. Maximum nitrogen and phosphorus uptake by plant was found significant in treatment 75 per cent RDF + Vermicompost + *Rhizobium* + PSB. Thus their was increase in soil fertility level by using biofertilizer, FYM, vermicompost along with chemical fertilizer as compared to chemical fertilizers alone.

Key words : Cowpea, *Rhizobium*, Phosphate solubilizing bacteria, FYM, Vermicompost

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Cowpea is one of the most important leguminous vegetable crop. Leguminous crops play an important role in Indian Agriculture. They have unique ability of biological nitrogen fixation, deep root system, mobilization of insoluble soil nutrient and bringing qualitative changes in soil. Cowpea (*Vigna unguiculata* L.) belongs to the family leguminosae and having chromosome number $2n=22$ with genus *Vigna*. It is originated from Central Africa and mainly cultivated in Asia, Africa, Central and South America. The countries like Bangladesh, China, India and Indonesia are the major cowpea growing countries in Asia. In India it is grown in the states like Rajasthan and adjoining a part of Himachal Pradesh have a good acreage under this crop.

There is worldwide consensus that sole dependence on chemical input based agriculture is not suitable in long run and only integrated plant nutrient system (IPNS) involving a combination of fertilizer, organic manures and bio-fertilizers are essential to sustain crop production, preserve soil health and biodiversity. Integrated effort are required to boost up the yield of cowpea in order to supply

a balanced diet to increasing population of our country.

RESEARCH METHODS

A field experiment was carried out during year 2010-11 at the field of Horticulture farm, Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The experiment was laid out in a Randomized Block Design with three replications. There were 16 treatments *viz.*, T₁ - RDF 25:50 kg ha⁻¹ NP, T₂ - 2.5 t ha⁻¹ FYM, T₃ - 1.65 t ha⁻¹ vermicompost, T₄ - 2.5 t ha⁻¹ FYM + 2.4 kg ha⁻¹ *Rhizobium* + 2.5 kg ha⁻¹ PSB, T₅ - 1.65 t ha⁻¹ vermicompost + 2.4 kg ha⁻¹ *Rhizobium* + 2.5 kg ha⁻¹ PSB, T₆ - 75 per cent RDF + 0.62 t ha⁻¹ FYM + 2.4 kg ha⁻¹ *Rhizobium* + 2.5 kg ha⁻¹ PSB, T₇ - 75 per cent RDF + 0.41 t ha⁻¹ vermicompost + 2.4 kg ha⁻¹ *Rhizobium* + 2.5 kg ha⁻¹ PSB, T₈ - 50 per cent RDF + 1.25 t ha⁻¹ FYM + 2.4 kg ha⁻¹ *Rhizobium* + 2.5 kg ha⁻¹ PSB, T₉ - 50 per cent RDF + 0.82 t ha⁻¹ vermicompost + 2.4 kg ha⁻¹ *Rhizobium* + 2.5 kg ha⁻¹ PSB, T₁₀ - 25 per cent RDF + 1.87 t ha⁻¹ FYM + 2.4 kg ha⁻¹ *Rhizobium* + 2.5 kg ha⁻¹ PSB, T₁₁ - 25 per cent RDF + 1.23 t ha⁻¹ vermicompost + 2.4 kg ha⁻¹