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Growth attributes and nutrient uptake of green gram as influenced by vermicompost and zinc in arid western Rajasthan

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ABSTRACT : A field experiment was conducted during *Kharif* season to find out the effect of vermicompost and zinc application on growth attributes of green gram [*Vigna radiata* var. *aureus* (L.) wilczek]. The treatments comprised of five organic manure (Control, FYM @ 10 t ha⁻¹, vermicompost @ 5 t ha⁻¹, vermicompost @ 7.5 t ha⁻¹ and vermicompost @ 10 t ha⁻¹) and four spray of zinc sulphate (control, at initiation of branching, at initiation of flowering and at initiation of branching as well as flowering) were laid out in Randomized Block Design. Application of increasing levels of vermicompost from 5 to 7.5 t ha⁻¹ significantly enhanced the plant height at harvest, dry matter accumulation at 30, 45 and 60 DAS, dry weight of root nodules at 30 and 45 DAS, total chlorophyll content in fresh leaves at 30, 45 and 60 DAS, leaf area index at 30, 45, and 60 DAS, CGR during 30-45 and 45-60 DAS, RGR during 45-60 DAS, NAR during 45-60 DAS, total nitrogen, phosphorus, potassium and zinc uptake of green gram. Further an application of foliar spray of zinc at both branching and flowering stage in green gram significantly increased the plant height at harvest, dry matter accumulation at 45 and 60 DAS, dry weight of root nodules at 45 DAS, total chlorophyll content in fresh leaves at 30, 45 and 60 DAS, leaf area index (LAI) at 30, 45, and 60 DAS, CGR during 30-45 and 45-60 DAS, RGR during 30-45 and 45-60 DAS, NAR during 45-60 DAS, total nitrogen, phosphorus, potassium and zinc uptake, net return and B:C ratio of green gram.

Key Words : Green gram, Organic manure, Zinc, Growth attributes

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Green gram [*Vigna radiata* (L.) wilczek var. *aureus*] commonly known as “Moong” is an important pulse crop of India. Being a leguminous crop, green gram fixes 30-40 kg nitrogen ha⁻¹. After picking of pods, it may be used as green manure. It is a spreading type crop and helps in preventing soil erosion. The pulses are the chief sources of protein in a balanced diet in Indian conditions and contribute about 15 per cent of diet. The world's arable land resources are finite and there is not much scope for significantly expanding the area of land under cultivation. Hence, most of the increase in agricultural production will have to be obtained through increased productivity from the existing agricultural land. Amongst various factors that limit the yield of green gram are poor soil fertility and its management has been recognized as one of the important constraint in green gram production. Since, the soils of North- Western Rajasthan are very low in organic matter as well as major and micro nutrients essential for healthy

crop growth.

Vermicomposting or vermiculture revolution is a buzz word now days. Indian farmers had been using the FYM adages and its role in crop production and plant nutrition is well proved and documented. Vermicompost is dropping of earthworms after the intestinal digestion of organic matter; these dropping are high in nutritive value. Since vermicompost helps in enhancing the activity of micro-organisms in soils which further enhance solubility of nutrients and their consequent availability to plants is known to be altered by micro-organisms by reducing soil pH at micro sites, chelating action of organic acids producing by them and intraphyl mobility in fungal filaments (Chhonkar, 2002). Thus, in organic carbon deficient arid and semi arid soils, vermicompost would not only increase organic carbon status of soil but also increase the soil water holding capacity, soil flocculation and crop production sustainable one (Rajkhowa *et al.*, 2000).