

Research Paper

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## Pattern of dry matter accumulation in chickpea (*Cicer arietinum* L.) as influenced by organic nutrient management practices in vertisol

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**ABSTRACT :** Field trials were conducted on vertisols at Agricultural Research Station, Annigeri, UAS, Dharwad during *Rabi* season of 2009-2010 and 2010-2011 to study the pattern of dry matter accumulation in chickpea as influenced by organic nutrient management practices in vertisol. Soil application of various organic manures and foliar spray of liquid organic manures at flower initiation and 15 days after flowering (DAF) significantly influenced the dry matter accumulation in leaves, stem, reproductive parts and total dry matter production. Among the treatment combinations, application of enriched compost (EC) (1/3) + vermicompost (VC) (1/3) + glyricidia leaf manure (GLM) (1/3) equivalent to 100 per cent RDN and foliar spray of panchagavya @ 3 per cent at flower initiation and 15 DAF had recorded significantly higher dry matter accumulation in leaves(4.59g/plant) at 90 DAS, stem(5.00g/plant) at harvest, reproductive parts(16.99g/plant) at harvest and total dry matter production(24.34g/plant) at harvest as compared to other treatment combinations.

**Key Words :** Organic manures, Liquid organic manures, Chickpea, Dry matter accumulation

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Chickpea (*Cicer arietinum* L.) remarkably predominates among other pulse crops in terms of both area and production. The year 2009-2010 marked significant increase in area under chickpea (8.56 million ha) which is highest in last 10 years. Similarly, the chickpea production (7.35 million tonnes) also surpassed last 50 years record with highest productivity (858 kg/ha) ever recorded in the history of India. The area under chickpea has increased from 6.45 million ha in 1992-1993 to 8.56 million ha in 2009-2010. Similarly, in Karnataka, the area under chickpea increased 2.7 times and production increased 4.4 times during the same period. During the period 1991-93 to 2006-08, highest increase in productivity of chickpea has been recorded in Andhra Pradesh (124%), followed by Karnataka (63%), Maharashtra (52%) and Gujarat (40%). Still there is scope for productivity enhancement in states like Karnataka, Gujarat, Bihar, Haryana etc. to make more availability of chickpea at national level (Anonymous, 2010).

The dry matter production and its accumulation are the best measure and index of the total performance and response

of a crop to weather conditions (Mall *et al.*, 2000). The yield of a crop does not largely depend on the dry matter production alone but also in its distribution to reproductive parts; as major part of the dry matter is translocated to sink from source (Acevedo *et al.*, 1990). Optimum plant population utilizes available moisture and nutrients from the soil more effectively and leads to better dry matter production and accumulation which reflects in yield of crop. The pre-requisite for high yield is related to the ability of a genotype to produce high amounts of total dry matter. The manner in which the net dry matter produced will determine the economic yield. The total nutritional consumption from chemical fertilizers is about 20.34 million tons (Anonymous, 2006) in India. To augment this, India is endowed with enormous potential of natural resources and industrial by products (Katyal, 2000). India with the second largest human population and the highest cattle population is sustained seventh largest on the geographical area, which is seventh largest in the world with tropical and sub-tropical climate has greater pressure on natural resources. However, it