



Pattern of assimilate partitioning in chickpea (*Cicer arietinum* L.) cultivars for high yield

PRATIBHA KATIYAR

Department of Crop Physiology, Agricultural Biochemistry and Herbal Science, College of Agriculture, Indira Gandhi Krishi Vishwa Vidyalaya, RAIPUR (C.G.) INDIA (Email : pratibhakatiyar@redifmail.com)

Abstract : Twenty divergent cultivars of chickpea (*Cicer arietinum* L.) grouped into four categories on the basis of seed index ranged between 12-24 g were tested in field conditions in *Rabi* season in RBD replicated thrice at IGAU, Raipur (C.G.) to study the variability in pattern of assimilate partitioning for high yield. The highest magnitude of genotypic variation was observed for seed yield per plant. The study revealed that the cultivars with higher in CGR, HI, seed index, chlorophyll b and total chlorophyll content at flowering stage, sugar content in seed, lesser nodes and branches per plant and higher pods per plant had the significantly higher economic yield. The results elucidated the number of primary and secondary branches per plant, pod bearing length, effective secondary branches were not affected by seed index. The low test weight cultivars had higher seed yield per unit area. However, the optimum filling stages showed significant impact in assimilate partitioning and economic yield in low and medium seed index cultivars. Higher chlorophyll a, b and total chlorophyll content at flowering stage and lesser nodes and more productive secondary branches per plant contributed significant impact on seed yield.

Key Words : DAS (days after sowing), LAI (leaf area index), LAR (leaf area ratio), LWR (leaf weight ratio), SLA (specific leaf area), SLW (specific leaf weight), CGR (crop growth rate), HI (harvest index)

View Point Article : Katiyar, Pratibha (2012). Pattern of assimilate partitioning in chickpea (*Cicer arietinum* L.) cultivars for high yield. *Internat. J. agric. Sci.*, 8(1): 119-124.

Article History : Received : 26.04.2011; Revised : 12.09.2011; Accepted : 07.11.2011

INTRODUCTION

Chickpea is an important food legume widely consumed in Asia, the middle East and several mediterranean countries. Chhattisgarh state of India has good ecological conditions for chickpea production but the productivity of chickpea in the state is 528 kg/ha, which is very low in comparison to national average of 855 kg/ha. This gap needs more serious efforts to increase its productivity in the region (Rajput *et al.*, 2003). The study therefore, been planned to identify the morpho physiological traits to find out the pattern of assimilate partitioning in chickpea cultivars for high yield.

MATERIALS AND METHODS

The field experiment was conducted at instructional farm of Indira Gandhi Krishi Vishwavidyalaya, Raipur (CG) in *Rabi* season 2006-07 using twenty cultivars of chickpea grouped into three categories on the basis of seed index (Seed weight 100 seed) ranged between 12-24g. The experiment was

conducted in RBD replicated thrice. The morpho physiological and biochemical observations were taken at different physiological stages of crop growth. Chlorophyll content of leaves was estimated (Yoshida *et al.*, 1972) at 45 and 60 DAS. Sugar content was estimated (Duboise *et al.*, 1951) at 60 and 90 DAS.

Protein content by Microkjeldhal method (AOAC, 1965) at maturity in seed. Growth analysis was done for measuring the LAI (Watson, 1947) LAR (Radford, 1967), LWR (Beadle, 1982), SLA (Kevt *et al.*, 1971), SLW (Beadle, 1982), CGR (Patter and Jones, 1977) and HI (Synder and Carlson, 1984). The morpho-physiological observations were taken at 30 (S I), 60 (S II) 75 (S III) 90 (S IV), 105 (S V) and at physiological maturity. Yield attributes were recorded at physical maturity (dead ripe stage).

RESULTS AND DISCUSSION

The efficient partitioning of photo assimilates towards