

Morphological variation, growth and yield and character association in various genotypes of chickpea (*Cicer aritinum* L.) under rainfed condition of Bundelkhand Region

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ABSTRACT

Fifteen varieties of chickpea (*Cicer aritinum* L.) were tested in randomized block design in three replications during Rabi season 2003-04 at Research farm of Bundelkhand University, Jhansi. In experiment significant Variability exists in the base material, correlation coefficient was significant for 79 values out of these 54 values were positive and 25 values were negative. BG-1091 performed better than other in respect of 50% flowering, days to maturity while BG-1086 performed with well respect to height. Maximum number of branches, number of pods/plant were found in Pusa-209. Test weight grain/plant, harvest index were maximum in BG-1091 followed by BGD-72, BG-109A and BGD-72 respectively. In case of quantitative characters of chickpea, the protein content and seed hardness was maximum in varieties/accessions BGD-72 and BG 1095 fifteen varieties were evaluated respect with seed yield / plot. Seed yield production was found to be BGD-72 to was superior for seed yield/plot, seed yield/ha, grain yield/plot, protein content (%) than rest of the varieties.

Key words : Morphological variation, Growth, Yield, Quality attribute, Genotypic and Phenotypic correlation, Chickpea.

INTRODUCTION

Chickpea is normally grown under unirrigated condition during rabi season in Bundelkhand region. It occupied area of about 11.2-lakh hectare area with the production of 10.84 lakh metric tones in 2002-03 (Jhansi and Chitrokoot Division). It contributed about 42% in area and production with 963-kg /ha productivity less behind other divisions of states (1). The production and productivity of pulses has not increased markedly in the last 3-4 decades, consequently. The net availability of pulses per capita has declined. Therefore, maximum strides in production of these crops should be made in near future, as human needs will change continuously.

The self-sufficiency in pulse production could not be achieved due to various constrains. In general, they have inherent low yield potential because of the high biological energy required for production. They are less responsive to added doses of inputs, highly susceptible to pest and diseases, severely damaged by storage pests. Among the constraints the non-availability of quality seeds in sufficient quantities and lack of adequate information on improved seed production methods. It is urgently required that release of new varieties for increasing production of pulses as a national priority.

Yield is a complex character and is the final product generated by the inherited characters that the controlled by polygenes and are markedly influenced by environmental fluctuation. Seed yield in chickpea like any other crop is dependent upon a number of components characters may facilitate the interpretation of result and provide the basis for planning more efficient breeding and seed production programmes. The knowledge on components, contributing to grain yield may be helpful in order to enhance the productivity level. Therefore, for attaining the higher yield level in chickpea the breeder required to simplify this complex situation though handling of the yield components. For this rational approach, it is essential to have greater information on the genetics of yield along with nature and magnitude of association between yield components and their mode of contribution to grain yield. It is difficult to get immediate release of high yielding varieties to achieve this goal; the genetic studies on the different parameters in chickpea need to examine the nature genetic variability, correlation coefficient and varietal differences.

Considering the above facts to estimate the correlation coefficient, varietal differences of vegetative, yield and qualitative attributes of chickpea under rainfed condition undertaken with 15 varieties with objectives to study the correlation coefficient of various components characters towards seed yield, to find out the varietal differences of vegetative, yield and qualitative attributes.

MATERIAL AND METHODS

Fifteen varieties of chickpea (*Cicer aritinum* L.) were evaluated in randomized block design and replicated thrice during Rabi 2003-04 at Research Farm of Bundelkhand University Jhansi. Each entry was show in 5m X 3m plot at 60 X 15cm spacing. Observations were recorded on randomly selected competitive plants of each entry on days to 50% flowering, maturity, plant height, number of branches per plant, number of pods per plant, test weight, grain seed yield per plant, biological yield per plant, harvest index (%), protein content (%), seed hardness seed yield per plot and seed yield per hectare. The genotypic and phenotypic correlations among the characters under study were estimated by Searle (1961).

RESULTS AND DISCUSSIONS

Highly significant variances were observed for the different varieties for all the characters. It indicated that significant variability exists in the base materials (Table-1)

Correlation Coefficient

Generally the magnitude of genotypic correlation coefficients was higher than their corresponding phenotypic correlation coefficients. In the present investigation, correlation coefficients were significant for 79 values Out of these 54 values were positive and 25 values were negative. The findings are conformity with the findings of Singh et-al (2001). Constant significant correlations were also observed in both genotypic and phenotypic levels. Positive and significant correlations were recorded for number of branches per plant with grain yield and protein content, 100-seed weight with seed hardness and seed yield per plant with biological yield per plant, seed yield per plant and seed yield per hectare, biological yield per plant with harvest index and protein content, protein content with seed hardness, seed yield per plot with seed yield per plot with seed yield per hectare. Significant negative correlation coefficient value were observed for days to 50% flowering with days to maturity, days to maturity with seed yield per plot, plant height with number of branches per plant. Similar results were supported, Singh, et-at, (2001).

Varietal differences based on mean value for different traits:

Days to 50% flowering varied from 45.75 in case of BG-1044 to 75.20 in BG-1091 with an over all mean value of 62.60 days the number of days to maturity was minimum for the BG-1044 and maximum in case of BG-1091 the mean value for days to maturity was 152.53 days, The range of variation for plant height was from 62.6 cm in case in case of Pusa-267 to 80.00 cm in case of BG-1086 with mean value of 72.87 cm. The mean value of the number of branches/plant over all