



RELATIONSHIP AMONG GREEN POD YIELD AND IT'S CONTRIBUTING CHARACTERS IN RED GRAM

S. Ramesh Kumar, N. R. Rangare and G. Eswara Reddy**

Department of Genetics and Plant Breeding, Allahabad School of Agriculture,
Sam Higginbottom Institute of Agriculture, Technology and Sciences (Formerly Allahabad Agricultural Institute)
Deemed-to-be-University, Allahabad - 211 007 (Uttar Pradesh), India

Abstract

An investigation was carried out with 27 pigeon pea genotypes to assess the association of grain yield components on grain yield per plant. Results of correlation analysis indicated that the grain yield per plant was found to be significant and positively correlated with number of pods per plant, days to maturity, harvest index, biological yield per plant, days to initial flowering, number of grains per pod and days to 50% flowering. Pods per cluster exhibited negative non-significant correlation at phenotypic level with grain yield per plant. The present study indicated that number of pods per plant, days to maturity, harvest index, biological yield per plant, days to initial flowering, number of grains per pod and days to 50% flowering are important characters in deciding the grain yield per plant. These characters may be considered as selection indices in pigeon pea breeding programme.

Key words : Correlation, grain yield, pigeon pea,.

Introduction

Correlation coefficient is a statistical measure, which is used to find out the degree (strength) and direction of relationship between two or more variables. The association between two variables, which can be observed, is termed as phenotypic correlation. It includes both genotypic and environmental effects. Genotypic correlation may be either due to pleiotrophy action of genes or due to linkage or more likely both (Falconer, 1981). The pleiotrophy or linkage may involve two desirable traits or one desirable and one undesirable trait. The first situation enhances the genetic improvement, whereas the second hinders the progress.

The correlation co-efficients provide a reliable measure of association among the characters and help to differentiate vital associations useful in breeding from those of the non-vital ones (Falconer, 1981). Keeping the above aspects, present experiment intended to construct selection criteria for pigeon pea yield improvement.

Materials and Methods

The experiment material for the present investigation comprised of 25 genotypes of cultivated pigeon pea and

2 standard check varieties (Narendra-1 & Bahar). The material, comprising different genotypes exhibited wide spectrum of variation for various agronomic and morphological characters. All genotypes were grown in *kharif*, 2011 at the Field Experimentation Centre, Department of Genetics and Plant Breeding, Allahabad School of Agriculture, SHIATS, Allahabad (U.P.), India in Randomized Block Design (RBD) with three replications. This experimental site is situated at an elevation of 98 meters above the sea level, it is situated at 25.87 N latitude and 81.5 E longitude in eastern Uttar Pradesh. Genotypes spaced with a spacing of 90 cm and 50 cm between rows and hills, respectively. Five representative hills for each genotypes in each replications were randomly selected to record the observations for eleven quantitative traits *viz.*, days to initial flowering, days to flowering, plant height, number of primary branches per plant, number of pods per cluster, number of pods per plant, number of grains per pod, biological yield per hill, days to maturity, harvest index, seed index, pod length and grain yield per hill. Two characters *viz.*, days to 50 per cent flowering and days to maturity were computed on plot basis. The genotypic and phenotypic correlation coefficients were worked out by following the method of Singh and Chaudhary (1945).

***Author for correspondence:** E-mail: eswarmaagrico@gmail.com

Table 1 : Phenotypic correlation of different yield component with grain yield per plant in pigeon pea.

S. no.	Characters	Days to initial flowering	Days to 50% flowering	Days to maturity	Plant height	No. of primary branches per plant	No. of pods per plant	No. of pods per cluster	Pod length	No. of grains per pod	Biological yield per plant	Harvest index	Seed index	Grains yield per plant
1.	Days to initial flowering	1.00	0.88**	0.71**	0.62**	0.21	0.22*	0.02	-0.36**	0.06	0.73**	-0.42**	0.17	0.39**
2.	Days to 50% flowering		1.00	0.76**	0.67**	0.17	0.18	-0.11	-0.58**	0.05	0.80**	-0.54**	0.18	0.35**
3.	Days to maturity			1.00	0.79**	0.56**	0.06	0.12	-0.38**	0.30**	0.76**	-0.45**	-0.08	0.43**
4.	Plant height				1.00	0.53**	-0.19	0.15	-0.39**	0.23*	0.69**	-0.59**	0.00	0.13
5.	No. of primary branches per plant					1.00	-0.22*	0.13	0.00	0.05	0.32**	-0.25*	-0.40**	0.12
6.	No. of pods per plant						1.00	-0.02	0.00	0.04	0.28*	0.26*	-0.00	0.68**
7.	No. of pods per cluster							1.00	0.08	0.08	-0.01	0.01	-0.21	-0.00
8.	Pod length								1.00	0.30**	-0.33**	0.41**	0.20	0.05
9.	No. of grains per pod									1.00	0.27*	0.06	0.28**	0.36**
10.	Biological yield per plant										1.00	-0.66**	0.16	0.39**
11.	Harvest index											1.00	-0.13	0.39**
12.	Seed index												1.00	0.00

Results and Discussion

The degree of correlation observable among attributes will depend on the development relations between them and on genes, which contribute to the variation. Positive correlation occur due to changes of genes supplying precursors. On the other hand, negative correlation arises due to competition among the traits for a common precursor, which is restricted supply. In the present investigation, correlation is worked out among thirteen characters. Results of correlation analysis indicated that grain yield per plant is found to be significant and positively correlated with number of pods per plant (0.681**), days to maturity (0.435**), harvest index (0.395**), biological yield per plant (0.393**), days to initial flowering (0.391**), number of grains per pod (0.369**) and days to 50% flowering (0.359**). A strong correlation of these traits with grain yield indicated that simultaneous improvement of all the characters is possible. This is in agreement with the reports of Francis Kwame Padi (2003) and Anuradha *et al.* (2007) reported that there is significant positive association between number of pods per plant and grain yield per plant. Similarly, Deshmukh *et al.* (2000), Mausami Das *et al.* (2007), Vange and Moses (2009), Vasantha Rao *et al.* (2010) were reported that a day to maturity is significantly positively associated with grain yield per plant. Vasantha Rao *et al.* (2010) reported that harvest index is positively significantly associated with grain yield per plant. Pods per cluster (-0.001) exhibited negative non-significant correlation with grain yield per plant. Regarding inter correlations between different characters revealed that days to 50% flowering show positive significant correlation with biological yield per plant (0.803**), plant height exhibited positive significant correlation with biological yield per plant and number of grains per pod; pod length per plant exhibited positive significant correlation at phenotypic level with harvest index and number of grains per pod; number of grains per pod exhibited positive significant correlation at phenotypic level with pod length and seed index (table 1).

From the correlation studies, it was inferred that grain yield per plant had significant and positive association with number of pods per plant, days to maturity, harvest index, biological yield per plant, days to initial flowering, number of grains per pod and days to 50% flowering. Hence, in the

improvement programme due importance may be given for these traits to improve genetic yield potential in pigeon pea.

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