ICP 7991	1470	7.3 ** ++	-287.6
ICP 12746	1134	-10.2	63780.8 $
ICP 7346	1277	9.2 ** ++	648.2
ICP 7939	1021	-5.2	20901.0 $
ICP 7867	1129	13.1 *	31845.9 $
ICP 11191	839	-2.3	1793.6 $
ICP 12825	754	-9.0 *	11445.3 $
ICP 12159	796	0.04	-314.1
ICP 12747	1259	-5.2	44777.7 $
ICP 8514	1037	-13.0	54661.0 $
ICP 12749	1288	11.9 ** ++	6507.5 $
ICP 7878	910	-6.7 ** ++	3054.8 $
ICP 14002	1055	12.2	56091.1 $
ICP 8047	928	0.8	8206.6 $
ICP 14269	884	4.5	9480.4 $
ICP 12904	898	12.5 *	27453.1 $
SA 1	1095	1.3	6171.2 $
CD AT 5%	60		

$ significant at 5% level against pooled error
*, ** significant at 5% and 1% level respectively against b=0
+, ++ significant at 5% and 1% level respectively against b=1

as responsive under unfavourable environments. The non- significant bi value indicates the genotype seed yield, they are unstable. While considering S^2d, bi values and mean seed yield together, the genotypes ICP 7991 and ICP 7346 were considered as stable. The genotype ICP 12159, was stable less response over environments but poor yieldr. Thus the present study reveals that the prediction of performance of genotypes over environments would be difficult in late maturing type of pigeonpea. The genotypes namely ICP 7991 and ICP 7346 were found to be stable with higher seed yield. Hence, these genotypes can be suggested for commercial cultivation and can be utilized in further breeding programme.

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INTER-RELATIONSHIP BETWEEN YIELD AND ITS COMPONENT CHARACTERS IN PEARL MILLET

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ABSTRACT

The analysis of inter-relationship among different characters in 76 genotypes of pearl millet (*Pennisetum glaucum* (L.) R. Br.) showed that the grain yield possessed a high and positive association with number of productive tillers, plant height, and 1000 grain weight. The characters, plant height, days to 50% flowering and ear length were mutually correlated. The character pairs, ear length and ear thickness ; and 1000 grain weight and number of productive tillers were positively correlated with each other. The path coefficient analysis revealed that number of productive tillers and plant height had both direct and indirect effects to account for yield. The character thousand grain weight which had positive correlation with yield, showed negative direct effect but had indirect effect through plant height, number of productive tillers, ear length and ear thickness.

KEY WORDS : Pearl millet, correlation, path coefficient

The main objective in any crop improvement programme is to improve yield per unit area and time. Yield is a complex trait and is determined by many of its components. A better picture of the contribution of each component in building up the total genetic architecture of a complex character may be obtained through the correlations. The knowledge of association of the yield components *inter se* and with grain yield is useful for formulating efficient selection criteria for desired improvement. Further, the direct and indirect influence of such component characters on yield

Table 1. Genotypic (G) and Phenotypic (P) correlation coefficients between yield and its components

		Plant height	No. of productive tillers	Ear length	Ear thickness	1000 grain weight	Grain yield
Days to 50% flowering	G	0.486**	0.195	0.286**	0.207	0.138	0.197
	P	0.461**	0.139	0.256*	0.184	0.131	0.193
Plant height	G		-0.111	0.618**	0.218*	0.048	0.240*
	P		-0.048	0.568**	0.201	0.045	0.223*
No. of productive tillers	G			-0.348**	-0.251*	0.257*	0.543**
	P			-0.268*	-0.169	0.206	0.438**
Ear length	G				0.361**	0.100	0.201
	P				0.329**	0.097	0.177
Ear thickness	G					-0.037	-0.051
	P					-0.036	-0.056
1000 grain weight	G						0.225*
	P						0.210

* Significant at 5% level ; ** Significant at 1% level

an obviously be of considerable use for a rational breeding approach. The present study was, thus, undertaken to determine the nature and degree of association between different characters and to establish an understanding for direct and indirect selection of different traits.

MATERIALS AND METHODS

A total of 60 hybrids was produced by crossing 10 CMS lines *viz.*, ICMA 88004, ICMA 88006, ICMA 89111, ICMA 90111, ICMA 91222, ICMA 91333, ICMA 91444, ICMA 91555, ICMA 91666 and ICMA 91777 and 6 testers viz., PT 833/4, PT1890, PT 1921, PT 3075, PT 3095 and PT 4604. All the hybrids along with their parents were raised in a randomised block design replicated three times at Tamil Nadu Agricultural University, Coimbatore, during summer 1993. Each genotype was accommodated in plots of two rows of 3m length, an interplant distance of 15 cm and inter row distance of 45 cm. The observations were recorded on five random plants in each genotype for the traits : days to 50 per cent flowering, plant height, number of productive tillers, ear length, ear thickness, 1000 grain weight and grain yield per plant. The phenotypic and genotypic correlations between different traits and path coefficient analysis were carried out.

RESULTS AND DISCUSSION

The analysis of variance for the experimental design revealed significant differences among the genotypes for all the traits under study. Grain yield showed high and positive association with number of productive tillers, plant height and 1000 grain weight (Table 1). Various workers (Jindla and Gill, 1984 ; Rao *et al.*, 1987) have also reported positive association of grain yield with number of productive tillers, plant height and 1000 grain weight. Sangha and Singh (1973) observed negative correlaiton of grain yield with 100 grain weight. The traits plant height, days to 50% flowering and ear length had positive correlation with each other. The character pairs ear length and ear thickness and 1000 grain weight and number of productive tillers were positively correlated with each other. Under such situations selection for increased manifestation of one character would eventually lead to higher phenotypic expression of the other traits and *vice-versa.*

Fortunately grain yield was found to be positively associated with plant height, number of productive tillers and 1000 grain weight. Thus, selection of plants with more number of produtive tillers, taller plants with bigger grain size will lead to increased grain yield. Negative association of ear length and ear thickness with number of productive tillers revealed that selection for more number of productive tillers would not yield long and thick ears. Kunjir and Patil (1986) and Borle and Patil (1991) also reported negative association of ear length and ear thickness with number of tillers per plant.

Path co-efficient analysis was done to determine the direct and indirect effects of

Table 2. Direct and indirect effects of different characters with yield

	Days to 50% flowering	Plant height	No. of productive tillers	Ear length	Ear thickness	1000 grain weight	Genotypic correlation coefficien
Days to 50% flowering	**-0.1184**	0.0606	0.1401	0.1194	-0.0049	-0.0002	0.1967
Plant height	-0.0576	**0.1246**	-0.0795	0.2576	-0.0053	-0.0001	0.2398*
Number of productive tillers	-0.0231	-0.0138	**0.7189**	-0.1453	0.0061	-0.0003	0.5426**
Ear length	-0.0339	0.0769	-0.2504	**0.4170**	-0.0087	-0.0001	0.2009
Ear thickness	-0.0244	0.0272	-0.1807	0.1506	**-0.0241**	0.0001	-0.0514
1000 grain weight	-0.0163	0.0059	0.1849	0.0509	0.0009	**-0.0013**	0.2250*

Residual : 0.7201

association between independent and dependent variables (Table 2) which indicated that number of productive tillers having maximum correlation with grain yield also exhibited very high direct effect. Raveendran and Appadurai (1984) and Borle and Patil (1991) also revealed that productive tillers per plant contributed positive direct effect on grain yield. The trait plant height having positive correlation with grain yield exhibited direct and also high indirect effect *via.*, ear length. Borle and Patil (1991) also reported direct contribution of plant height to grain yield. The above study revealed that the number of productive tillers per plant, plant height and 1000 grain weight are the most important traits which affected grain yield and should be given maximum emphasis during selection for the improvement of grain yield in pearl millet hybrids.

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VARIATION AND CHARACTER RELATIONSHIP IN GREEN GRAM X BLACK GRAM DERIVATIVES

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ABSTRACT

Four hundred and eighty six derivatives of green gram x black gram showed high magnitude of variability for plant height, number of pods per plant, seed yield, number of cluster, number of branches and pod yield. Moderate variability was found for pods per cluster, pod length, seed/pod and root length. Highly significant and positive association of seed yield with pod per cluster and pod yield ; pod yield with number of pods ; plant height with seeds per pod and number of branches with pod length and root length was found in the set of materials.

KEY WORDS : Variability, correlation, black gram x green gram derivatives