Nature of association among some quantitative traits in barley (*Hordeum vulgare* L.)

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ABSTRACT
Twenty five genetically diverse strains of barley were studied for correlation among eight characters i.e. Germination percentage, plant height, number of productive tillers per plant, ear length, number of grain per ear, grains weight per ear, thousand grain weight and grain yield per plant. Correlations between grain yield and other characters were partitioned into direct and indirect effects. Number of grains per ear was the most important character in exerting maximum direct effect on grain yield.

Key words : Correlations, Direct effect, Indirect effect, Path analysis.

INTRODUCTION

Grain yield is a complex trait influenced by several genetic factors interacting with environment. Success of any breeding programme for its improvement depends on the efficiency of selection. For a successful selection, it is necessary to study the nature of association of the character in question, with other relevant traits. Path coefficient provides a better index for selection rather than mere correlation coefficient by separating the correlation coefficient of yield and its components into direct and indirect effects. The present investigation was, therefore, undertaken to estimate the phenotypic and genotypic correlations and their direct and indirect effects on yield of barley.

MATERIALS AND METHODS

Twenty five genetically diverse strains were evaluated in randomized complete block design with three replications during the *Rabi* season of 2003-04 at crop Research Farm, Nawabganj, C.S.A. University of Ag. & Tech., Kanpur. Each genotype was grown in two rows with spacing of 23 cm in each replication. The data were recorded on five randomly selected plants from each plot and replication for eight quantitative characters viz., Germination percentage, plant height (cm), number of productive tillers per plant, ear length (cm), number of grains per ear, grain weight per ear (g), 1000 grain weight (g) and grain yield per plant (g). The mean data were utilized to estimate the correlation coefficients and their direct and indirect effects.

Path coefficient analysis was done by using the method suggested by Dewey and Lu (1959).

RESULTS AND DISCUSSION

The phenotypic and genotypic correlation coefficients among yield and yield components clearly indicated that grain yield per plant had positive and significant correlation with plant height, number of productive tillers per plant, ear length and grain weight per ear. Similar observation were reported in barley by Sethi and Singh (1972) and Mandal and Dana (1993).

Table 1: Estimates of genotypic (rg) and phenotypic (rp) correlation between different characters of barley

Characters		Germination (%)	Plant height (cm)	Number of productive tillers/plant	Ear length (cm)	Number of grain/ear (g)	Grain weight/ear (g)	1000 grain weight (g)	Grain yield/plant
Germination (%)	rp		-0.065	0.009	-0.001	0.010	-0.115	0.022	-0.088
	Rg		-0.340*	-0.044	-0.359*	-0.057	-0.241	-0.161	-0.278
Plant height (cm)			rp	0.657**	0.146	0.056	0.202	0.087	0.690**
			rg	0.876**	0.117	0.023	0.209	0.148	0.863**
Number of productive tillers/plant				rp	0.035	0.008	0.159	0.117	0.644**
				rg	0.000	0.122	0.216	0.128	0.920**
Ear length (cm)					rp	0.808**	0.480**	-0.351*	0.382**
					rg	0.935**	0.546**	-0.653**	0.468**
Number of grains/ear						rp	0.372**	-0.472**	0.329*
						rg	0.412*	-0.729**	0.430*
Grain weight/ear (g)							rp	0.185	0.487**
							rg	0.313	0.598**
1000 grain weight (g)								rp	0.130
								rg	0.071
Grain yield/plant (g)									Rp
									rg

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