

## EFFECT OF SALINITY ON VARIABILITY AND CORRELATION IN WHEAT SEEDLINGS

P. K. Roy

Central Arid Zone Research Institute, Regional Research Station,  
Pali Marwar - 306 401

In wheat, stress caused by alkalinity or salinity has a modifying effect on correlation among various characters (Singh and Rana 1985) and also influences the path coefficients among yield and its attributes (Kumar et al. 1986). As there is lack of information on how salinity affects character association at the early seedling growth stage including their emergence and the possibility of using the same in early selection of genotypes under saline situations this study was undertaken on 15 cultivars of common wheat-viz, WH-157, Raj 1972, HD 2260, Lok 1, Sonalika, HUW 251, HD 2189, KRL 2-11, WL 711, Kharchia 65, PBW 65, C 306, HD 2009, Kalyan Sona and HI 1152. Seed were germinated in dark (mean temperature  $21.6 \pm 0.3^\circ\text{C}$ ) on filter papers placed in petri dishes and soaked with 10 ml distilled water (control), 1% or 2% NaCl solution initially. A completely randomized design was followed with 3 replicates and 20 seed/replicate. After a week, observations on percentage germination root length, coleoptile length and coleoptile: root ratio (C:R) of the young seedlings were recorded and statistically analysed.

The variability estimates revealed that the genotypic coefficient of variation (GCV) increased under the saline conditions for germination and coleoptile length. Germination percentage and C:R ratio recorded higher phenotypic coefficient of variation (PVC) at high salinity of 2% NaCl and the remaining characters showed similar PVC in all control and saline situations. As the conditions of testing were uniform except the salinity factor, the observed changes in variability might be due to differential genotype x salinity interactions.

In control conditions, coleoptile length showed strong positive genotypic, phenotypic, and environmental correlation with root length (Table 1), the magnitude of which reduced in saline conditions. On the other hand, the association of germination with root or coleoptile length, though non-significant under control, was however, significant and positive at 2% NaCl. Similarly the phenotypic association between coleoptile length and C:R ratio became significant in saline environment.

The findings that high level of salinity besides increasing the variability leads to significant association of germination with root or coleoptile length suggest that germinability at high salt concentration, instead of low or moderate salinity, would be a more useful criterion for early screening of genotypes for salinity tolerance.

Table 1. Phenotypic, genotypic and environmental correlations in wheat seedlings raised with normal and saline waters

	Coleoptile length			Root length			Coleoptile : Root ratio		
	$r_P$	$r_G$	$r_E$	$r_P$	$r_G$	$r_E$	$r_P$	$r_G$	$r_E$
Germination(%)									
Control	0.254	1.022	0.147	0.315	0.717	0.177	-0.201	-0.268	-0.201
1%NaCl	0.302	0.676	-0.205	0.245	0.596	-0.323	0.268	0.474	0.002
2% NaCl	0.447*	0.715	0.284	0.659**	0.993	0.394	0.132	0.139	0.212
Coleoptile length									
Control				0.932**	0.934	0.993	0.019	-0.319	0.199
1% NaCl				0.781**	0.787	0.779	0.646**	0.619	0.689
2% NaCl				0.686**	1.009	0.545	0.853**	0.817	0.892
Root length									
Control							-0.321	-0.739	0.023
1%NaCl							0.052	0.019	0.111
2%NaCl							0.276	0.835	0.222

\*  $P=0.05$  \*\*  $P=0.01$  $r_P$ ,  $r_G$  and  $r_E$  refer to phenotypic, genotypic, and environmental correlation coefficients, respectively.

REFERENCES

- Kumar, D., Sharma, S.C. and Gupta, S.C. 1986. Correlation and path studies in wheat under normal and saline conditions. Wheat Information Service No. 61/62: 64-67.
- Singh, K.N. and Rana, R.S. 1985. Genetic variability and character association in wheat varieties grown on sodic soil. Indian Journal of Agricultural Sciences 55: 723-726.