



Short Communication

Association among yield attributes under different conditions in wheat (*Triticum aestivum* L.)

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Thirty six wheat (*Triticum aestivum* L.) genotypes were sown under randomized block design with 3 replications in the irrigated timely, late and very late sown situations during *rabi*, 2003-04 and 2004-05 to estimate association among various agronomical traits following recommended packages of practices in each environment. The plot size was kept as 3.0 m × 0.92 m (4 rows 23 cm. apart) under the irrigated timely sown condition and 3.0 m × 0.72 m (4 rows 18 cm. apart) in the irrigated late and very late sown situations. Observations were recorded on 9 agronomical traits (Table 1). Ten plants from each plot were randomly selected to record the observations on various traits except days to heading (75%), days to maturity (75%), spikes per meter and grain yield per plot (g) which were recorded on the plot basis. Standard methods were used for the analysis of variance and calculation of correlation co-efficient between various traits in each environment.

Analysis of variance showed highly significant differences among the genotypes with respect to all the traits under study. Under irrigated timely sown situation (E_1 and E_2), grain yield per plot had significant positive correlation with days to heading, days to maturity, spikes per meter, grain weight per spike and harvest index (Table 1). The spikes per meter recorded significant positive association with days to heading and days to maturity which was significantly correlated with each other. This trait exhibited significant negative correlation with grains per spike, grain weight per spike and 1000-grain weight. Grains per spike was observed to be significantly and positively associated with grain weight per spike which had significant positive correlation with 1000-grain weight and harvest index. 1000 grain weight had a significant and negative correlation with days to maturity. These findings infer that for an improvement in the yield of the wheat crop under the irrigated timely sown condition wheat varieties may be bred with more emphasis on spikes per meter, grain weight per spike, harvest index and days to maturity. Similar to the present findings, earlier workers also reported positive association of grain yield with spike

number [1-3], grain weight per spike [2], days to heading [4] and harvest index [4-5]. The reports of Palve and Raghavaiah [3] were also in conformity with the present findings with respect to the association among days to heading, days to maturity and spike number.

In irrigated late sown situation (E_3 and E_4), grain yield per plot exhibited significant positive correlation with spikes per meter, grain weight per spike and harvest index (Table 1). Grain weight per spike had significant positive association with 1000-grain weight, grains per spike and harvest index which, excluding grains per spike, were observed to be positively associated among themselves and negatively with days to heading. The trait days to maturity recorded significant positive correlation with days to heading and spikes per meter. These findings suggest that spikes per meter, grain weight per spike and harvest index may be considered as important traits for improving grain yield of wheat under irrigated late sown situation.

Under irrigated very late sown condition (E_5 and E_6), grain yield per plot recorded significant positive correlation with spikes per meter and harvest index and a significant negative association with plant height (Table 1). Spikes per meter showed positive association with harvest index but negative correlation with grains per spike. Grains per spike had significant positive correlation with grain weight per spike which was significantly and positively associated with 1 000-grain weight and harvest index. These findings infer that a genotype usually having high estimates for spikes per meter and harvest index with reduced plant stature, may be generated with more preference to improve the wheat yield under the irrigated very late sown condition.

References

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Table 1. Genotypic correlation among nine traits in wheat under six environments

Character#	Environment ^S	Ch ₂	Ch ₃	Ch ₄	Ch ₅	Ch ₆	Ch ₇	Ch ₈	Ch ₉
1	2	3	4	5	6	7	8	9	10
Ch ₁	E ₁	0.64**	-0.18	0.42**	-0.04	-0.06	-0.46**	-0.27	0.45**
	E ₂	0.66**	-0.14	0.36*	0.05	-0.01	-0.35	-0.16	0.35*
	E ₃	0.86**	-0.30	0.28	0.10	-0.24	-0.47**	-0.30	0.15
	E ₄	0.82**	-0.27	0.16	0.09	-0.21	-0.34*	-0.37*	0.12
	E ₅	0.85**	-0.28	0.16	-0.15	-0.03	-0.18	0.04	0.02
	E ₆	0.81**	-0.23	0.14	-0.14	-0.14	-0.14	-0.05	-0.05
Ch ₂	E ₁		0.09	0.55**	-0.05	-0.12	-0.36*	-0.18	0.35*
	E ₂		0.08	0.51**	0.01	0.19	-0.06	0.01	0.49**
	E ₃		-0.21	0.37*	-0.06	-0.15	-0.25	-0.23	0.27
	E ₄		-0.27	0.23	-0.01	-0.15	-0.20	-0.21	0.28
	E ₅		-0.19	0.17	-0.14	-0.10	-0.24	-0.11	0.05
	E ₆		-0.21	0.05	-0.18	-0.16	-0.18	-0.13	0.09
Ch ₃	E ₁			-0.26	0.31	0.15	0.31	-0.10	-0.05
	E ₂			-0.08	0.20	0.15	0.21	-0.22	-0.04
	E ₃			-0.22	0.06	0.15	0.24	-0.03	-0.15
	E ₄			0.02	0.10	0.20	0.18	0.02	-0.14
	E ₅			-0.06	0.19	-0.12	0.05	-0.22	-0.37*
	E ₆			0.06	0.26	0.22	0.08	-0.06	-0.07
Ch ₄	E ₁				-0.40*	-0.41*	-0.35*	-0.10	0.21
	E ₂				-0.28	-0.04	-0.18	0.32	0.55**
	E ₃				-0.20	-0.16	-0.14	-0.12	0.37*
	E ₄				0.12	0.27	0.05	0.24	0.70**
	E ₅				-0.38*	-0.28	0.14	-0.34	0.13
	E ₆				-0.09	0.19	0.22	0.48**	0.41*
Ch ₅	E ₁					0.69**	0.10	0.11	0.26
	E ₂					0.73**	0.14	0.27	0.32
	E ₃					0.56**	-0.18	0.20	0.13
	E ₄					0.68**	-0.16	0.28	0.17
	E ₅					0.59**	-0.26	0.20	0.16
	E ₆					0.54**	-0.15	0.25	0.09
Ch ₆	E ₁						0.40*	0.46**	0.31
	E ₂						0.52**	0.49**	0.43**
	E ₃						0.44**	0.53**	0.38*
	E ₄						0.31	0.49**	0.24
	E ₅						0.29	0.41*	0.26
	E ₆						0.39*	0.62**	0.24
Ch ₇	E ₁							0.14	-0.20
	E ₂							0.10	0.07
	E ₃							0.35*	0.17
	E ₄							0.33*	0.22
	E ₅							0.24	-0.02
	E ₆							0.30	0.16
Ch ₈	E ₁								0.42**
	E ₂								0.51**
	E ₃								0.52**
	E ₄								0.54**
	E ₅								0.39*
	E ₆								0.52**

#Ch₁-Days to heading (75%), Ch₂-Days to maturity (75%), Ch₃-Plant height (cm.), Ch₄-Spikes/m. length. Ch₅-Grains/spike, Ch₆-Grain weight/spike, Ch₇-1000-grain weight (g), Ch₈-Harvest index (%), Ch₉-Grain yield per plot (g), ^SE₁-Irrigated timely sown 2003-04, E₂-Irrigated timely sown 2004-05, E₃-Irrigated late sown 2003-04, E₄-Irrigated late sown 2004-05, E₅-Irrigated very late sown 2003-04, E₆-Irrigated very late sown 2004-05.

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