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Short Communication

CHARACTER ASSOCIATION IN WHEAT (*TRITICUM AESTIVUM* L. EM. THELL.)

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The grain yield of a crop is a complex character and is the final product of actions and interactions of various characters. It is well known that no independent gene system is present for grain yield *per se*, and hence understanding relationships among yield and its components is of paramount importance [1]. Therefore, a successful selection programme depends not only on the information on association among various yield component characters but also on the information of their association with grain yield. In the past, several studies have been conducted to study the correlation of different characters with yield in wheat by different workers [2-8]. The experimental material for these studies comprised either of the strains/varieties of wheat [3-5] or progenies resulting from various crosses [6-8]. In general, tillers/plant, spikes/plant, grain weight and grains/spike were found to be positively correlated with grain yield. The present study on correlations was undertaken to understand the nature of relationships of important characters with grain yield in semi-dwarf wheats.

Forty five semi -dwarf cultivars of wheat were evaluated in a randomized block design with three replications. Each cultivar was grown in two rows of 2m length, 30 cm apart under space planting conditions. Data were recorded on 10 randomly selected plants for eleven quantitative characters (Table 1). Correlation coefficients were calculated according to Miller *et al.* [9].

Analysis of variance revealed significant differences among genotypes for all the 11 characters indicating presence of considerable amount of genetic variability in the material under study.

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Only three out of the eleven characters, i.e. tillers/plant, yield/ear, and biological yield/plant, showed significant positive correlation with grain yield/plant. Among other traits, biological yield/plant had significant positive correlation with tillers/plant, grains/ear and yield/ear. Similarly, as expected, yield/ear was positively associated with grains/spikelet and grains/ear. The attribute spikelets/ear was positively correlated with days to flowering, ear length and grains/ear. A highly significant positive correlation also existed between grains/spikelet and grains/ear. On the other hand, significant negative correlation of grain weight was noticed with spikelets/ear, grains/spikelet and grains/ear. Spikelets/ear was also negatively correlated with tillers/plant (Table 1).

Table 1. Phenotypic and genotypic correlation coefficients among some characters in wheat (only important correlations are given)

Character pair	*Correlation coefficient*	
	genotypic	phenotypic
grain yield/plant - tillers/plant	0.41	0.51**
Grain yield/plant - yield/ear	0.62	0.45**
Grain yield/plant - biological yield/plant	0.96	0.79**
Biological yield/plant - tillers/plant	0.48	0.61**
Biological yield/plant - grains/ear	0.35	0.36*
Biological yield/plant - yield/ear	0.40	0.42**
Yield/ear - grains/spikelet	0.77	0.56**
Yield/ear - grains/ear	0.70	0.59**
Spikelets/ear - days to flowering	0.62	0.42**
Spikelets/ear - ear length	0.37	0.31*
Spikelets/ear - grains/ear	0.74	0.51**
Grains/spikelet - grains/ear	0.85	0.88**
100-grain weight - spikelets/ear	–0.50	–0.32*
100-grain weight - grains/spikelet	–0.33	–0.31*
100-grain weight - grains/ear	–0.55	–0.38*
Spikelets/ear - tillers/plant	–0.41	0.61**

*, **Significant at 5% and 1% levels, respectively.

In earlier studies on character association in wheat, grain yield was reported to be positively correlated with number of heads/plant, number of grains/head, grain weight and harvest index [3-4]. However, there are reports of negative correlation of plant height, grain weight and harvest index with grain yield [5-6].

Since heritability estimates of grain yield were usually lower than other characters in wheat, environmental effects constituted a major portion of the total phenotypic variation for this character. Thus, the selection of superior genotypes based on yield *per se* would not be effective. For a more efficient approach towards improvement of grain yield, selection should be exercised on its components. The association of plant characters with grain yield, thus assumes a special importance in determining as to which traits the selection should be applied to ultimately obtain high yielding genotypes. The present and earlier studies, therefore, suggest that selection in wheat should be based on number of effective tillers, biological yield and yield/ear.

Thus on the basis of present study it may be concluded that the characters like biological yield, tillers/plant, spikelets/ear, grain yield/ear and grains/ear may be of merit while making selection for high yielding genotypes in wheat.

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