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Combining ability analysis of grain yield and its contributing characters in bread wheat (*Triticum aestivum* L. em. Thell) under late sown condition

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ABSTRACT

Combining ability analysis was under taken in a 12 x 12 half diallel progenies (F_1 and F_2) for grain yield and its component characters under late sown condition (5th December). The mean squares due to gca and sca showed highly significant differences for all the characters in F_1 and F_2 generations, suggesting the importance of both additive and non-additive gene action. However, variances due to sca were higher in magnitude than gca variances for most of the traits except plant height and length of main spike in both the generations indicating the predominance of non-additive gene actions. The low predictability ratios for most of the traits in both generations also confirm the results. However, the predictability ratios for plant height and length of main spike were near to unity suggesting the importance of additive gene action in the inheritance of these characters. The estimates of gca effects of the parents revealed that HUW 234 (in both the generations), J 24 and GW 496 (in F_1) and GW 273, HD 2189 and Lok 1 (in F_2) were observed to be the good general combiners for grain yield and some its contributing traits. The perusal of sca effects for crosses in F_1 and F_2 generations revealed that the cross MACS 2496 x GW 173 was found to be good specific combiners with considerable *per se* performance in both the generations. The crosses GW 496 x HD 2189 in F_1 and GW 273 x GW 173 in F_2 gave the highest sca effects as well as *per se* performance in respective generation. These crosses also showed desirable sca effects for the important yield contributing traits like number of tillers per plant, number of grains per plant, flag leaf area and biological yield per plant. The crosses showing high sca effects for grain yield per plant involved high x high, high x low or low x low general combiners indicating the involvement of additive x additive, additive x dominance and dominance x dominance type of gene actions in the inheritance of these characters. The simple pedigree selection in succeeding generations and non-conventional breeding methods in form of biparental mating coupled with few cycles of recurrent selection could be utilized for the exploitation of additive and non-additive gene actions, respectively.

Key words : Diallel analysis, gca, sca, Bread wheat

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