

Estimation of components of genetic variance and graphical analysis in durum wheat (*Triticum durum* Desf.) under timely and late sown conditions

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SUMMARY

Genetic analysis was carried out by 8 x 8 diallel analysis (excluding reciprocals) under both timely and late sown condition. t^2 test indicated the fulfillment of assumptions required under diallel analysis for all the characters under study except plant height and 1000-grain weight under timely sown condition and days to maturity, 1000-grain weight, duration of flag leaf and harvest index under late sown condition. Narrow sense heritability was low for grain yield per plant and most of the other trait except days to heading, plant height and length of main spike which had moderate to high heritability under both the conditions. A higher proportion of dominant genes were observed in parent GW 1189 for affecting dwarf plant height, under late sown condition. The parental line BAWAJI was found having maximum recessive gene for increasing the length of main spike under late sown condition. Similarly parental line GW 1240 had maximum recessive genes for increasing grain protein under timely sown condition.

Key words : Genetic analysis, Wheat, Recessive and parental line, Sowing effect

In the breeding of high yielding varieties of crop plants, the breeder is confronted with the problem of choice of parents. Elimination of poor yielding crosses on the basis of their performance in early generation had been recommended, but it was felt that knowledge of the genetic architecture of yield and its attributes will help to sort out the better crosses more efficiently. Several reports in past have appeared which indicate that diallel analysis is the quickest method of understanding the genetic nature of quantitatively inherited traits and to ascertain the prepotency of parents. Kearsey (1965) noted that Hayman and Jinks' diallel analysis provide more information than other methods, but has more necessary assumptions. The analyses proposed by Griffing (1956) do not provide any test to detect epistasis or linkage. Hayman and Jinks' analysis does provide such test. When using Griffing's analysis to estimate variance components, it has been suggested that simple tests, such as the W_r - V_r evaluation found in Haymans' (1954) model, be used to ascertain the presence of epistasis and/or linkage disequilibrium (Pooni *et al.*, 1984; Wright, 1985).

MATERIALS AND METHODS

The present investigation consisted of eight diverse parental lines of durum wheat (*Triticum durum* Desf.) and their twenty-eight F₁s (excluding reciprocals). The parental lines *viz.*, GW-02-51, VDW-99-176, RD-1009, GW1139, GW1239, GW1189, BAWAJI and GW 1240 were selected from germplasm maintained at Main Wheat Research Station, Vijapur, (North Gujarat), during *Rabi*, 2007-08 to create a diallel set. The complete set of 36 genotypes comprising eight parental genotypes and 28 F₁'s were evaluated in Randomized Block Design (RBD) with three replications. The experimental material was raised in second week of December 2008-09. The observations were recorded both as visual assessment (days to heading, days to maturity and duration of flag leaf) and measurement on randomly selected five competitive individual plants (plant height, number of effective tillers per plant, length of main spike, spikelets per spike, grains per spike, 1000-grain weight, grain yield per plant, protein content, hectoliter weight and harvest index).

RESULTS AND DISCUSSION

The data are presented in Table 1. The results of t^2 test indicated the fulfillment of assumptions required under diallel analysis for all the characters under study except plant height and 1000-grain weight under timely sown condition and days to maturity, 1000-grain weight, duration of flag leaf and harvest index under late sown condition. Non-fulfillment of assumptions in these traits indicated the invalidity of the hypothesis of simple additive –

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