

## Genetic divergence in durum wheat cultivars

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### ABSTRACT

To identify the parents for crossing, three way crosses [(GW 1160 x Raj 6550) x PWD 274, (GW 1163 x WH 924) x DW 1001 and (GW 1163 x DW 1001) x AKDW 3085] and double crosses viz., [(HI 8381 x Raj 6550) x (Raj 1555 x WH 924)] and [(PWD 233 x Raj 6552) x (GW 1163 x DW 1001)] were suggested for breeding durum wheat cultivars. The genetic diversity was studied using the multivariate analysis among 47 durum wheat elite cultivars, using 11 quantitative traits. The grouping of material into 16 clusters indicated that presence of wide range genetic diversity. The maximum inter cluster distance was 20.51 in cluster XII and XVI. The study indicated no definite relationship between geographical and genetic diversity and genetic diversity cannot be used as an index of genetic diversity. The days to maturity, days to 50 per cent flowering, plant height and number of spikelets per ear contributed maximum towards the genetic diversity.

**Key words :** Durum wheat, Genetic divergencem, Cultivars.

### INTRODUCTION

The earlier work for the improvement of durum wheat was taken up in the beginning of this century along with the work on the *aestivum* wheat through pure line selection. As a result of this work, a number of varieties were selected in several parts of the durum growing areas (Gill, 1979). However, the durum wheat went out of cultivation on account of their low yield, susceptibly to lodging and yellow rust. In view of a substantial quality of wheat in the world market, there is need to concentrate the durum wheat improvement work. In any crop improvement programme, the choice of potential parents for hybridization decides the success of varietal breeding programme. The choice of parents based on *per se* performance; ecogeographic diversity has a limited success in the past. The choice of parents for hybridization programme based on multivariate analysis will provide a greater likelihood of promising transgrates. As  $D^2$  statistic seems to be a powerful tool in discerning divergence among based on multiple character and such information is limited for durum wheat, hence attempt has been made to study the genetic diversity in 47 durum wheat cultivars.

### MATERIALS AND METHODS

The present study was conducted at wheat Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola in *rabi* season in 1997-98. Forty-seven durum wheat cultivars were grown in simple lattice design with two replications. Each variety was sown in six rows of 6 metre length, with 30 cm row distance. Recommended cultural practices were followed to raise a good crop.

One metre row was randomly selected and the observation were recorded on 11 traits viz., days to flowering, flag leaf area, days to maturity, plant height, number of earheads per meter, number of spikelets per ear, number of grains per ear, seed index, biological yield per meter row length, grain yield per meter row length and harvest index. The data is given in Table 1.

Analysis of variance of plots means for different characters were calculated as per standard procedure. To study the genetic diversity in the above characters, the data were processed further by using Mahalanobis  $D^2$ -statistic described by Rao (1952). The simultaneous test of difference between mean values of the character studied, was done by using Wilk's criterion (Rao, 1952). For 47 genotypes, a total of 1081  $D^2$  values were calculated. The genotypes were grouped into different clusters according to Tocher's method (Rao, 1952).

### RESULTS AND DISCUSSION

The mean performance of the genotypes for eleven characters have been presented in Table 1 the days to 50% flowering ranged from 69 to 96 days. The genotype GW 1161 and PBNB 527 (69 days) was earliest among 47 genotypes. Flag leaf area ranged from 16.36 (Raj 6550) to 31.84 cm<sup>2</sup> (UPD 67). The mean values for days to maturity ranged from 107.5 to 135.5 days. The genotype GW 1160 matured in 107.5 days followed by WH 924 (108 days). The plant height ranged from 61.4 to 90.9 cm. The genotype GW 1161 recorded 61.4 cm plant height followed by DWR 1011 (62.40 cm) and HD 4679 (62.70 cm). Genotype Raj 6550 had shown maximum number of earheads per metre (90.0) followed by AKDW 3085

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