Internat. J. Plant Sci. Vol.2 No.2 July 2007 : 225-227

Genetic divergence in local land races of *rabi* sorghum

P.R.KHAPRE*, S.S.SHETE, S.P.POLE AND S.B.BORGAONKAR
Department of Botany, Sorghum Research Station, M.A.U., PARBHANI (M.S.), INDIA

(Accepted :June, 2007)

SUMMARY

Genetic divergence in 74 local land races (70 local germplasm lines and 4 checks viz., Swati, CSV 216 R, CSV 14 R and M-35-1) of *rabi* sorghum was assessed using D^2 analysis. All genotypes were grouped in to 9 clusters. The study revealed that the local land races of *rabi* sorghum possess diverse and desirable gene combinations, genetic diversity was independent of geographic origin. The path coefficient analysis revealed the maximum contribution of earhead weight, earhead girth, number of seconadries and number of leaves to the grain yield.

Key words: Genetic divergence, Germplasm, Clusters, *Rabi* Sorghum.

Sorghum [*Sorghum bicolor* (L.) Moench] is an important food and fodder crop of the world. To determine genetic diversity, Mahalanobis D^2 statistic has already been used as a very powerful tool, as it gives the inherent genetic diversity in crop plants has opened new vistas for improving them in the past and would continue in the future too. Genetically diverse plants are expected to produce high heterotic effects. Therefore, this tool will be helpful for determining variability and deciding breeding strategy for the crop.

MATERIALS AND METHODS

Seventy four *rabi* sorghum genotypes from different geographic regions were grown in randomized block design with two replications having plot size of 6.0 x 0.9 m and spacing of 45 x 15 cm, respectively. The observations were recorded on randomly selected five plants for 9 morphological characters.

The analysis of variance was carried out for all the characters individually. The data were subjected to the statistical analysis as per standard method of Panse and Sukhatme (1967). Mahalnobis D^2 statistic was used to assess divergence.

RESULTS AND DISCUSSION

Analysis of variance for each individual character showed highly significant differences among the genotypes for all the 9 characters studied. The estimates of D^2 values ranged from 6.73 to 3143.13 indicating adequate genetic diversity among the local germplasm lines. By the application of clustering technique the 74 local land races were grouped into nine clusters. The constituents of different clusters are presented in Table 1. The cluster I was the largest comprising thirty eight genotypes, while cluster II included fourteen genotypes, cluster III had nine genotypes, cluster IV had five genotypes, cluster V,VI,VII were consisted of two genotypes each while cluster VIII and cluster IX had one genotype each.

The maximum intercluster distance was recorded between VI and VIII (D=55.56) and minimum intercluster distance was found between cluster II and V (D=19.16) Table 2. Contribution of number of grains per earhead towards divergence was highest (26.58) followed by grain yield per plant. It was found that the local germplasm lines viz., 2 (Zolegaon-1), 44 (Shirala-2), 22 (Shirsav-7), 38 (Zolegaon-2), 15 (Pimpalgaon-1), 8 (Shirala-1) and 65 (Mangalweda-18) from Solapur, Aurangabad and Osmanabad district possess diverse and desirable gene combinations which may be utilized in crossing programme with locally adapted check varieties such as M-35-1, Swati, CSV 14 R and CSV 216 R.

Cluster means for all the characters has been presented (Table 3). The highest cluster mean for days to maturity was revealed by cluster III (134.10) followed by cluster IX (129.65). However cluster III (109.26) and cluster VII (109.97) recorded lowest cluster mean for this trait. For number of grains per earhead the highest mean was recorded by cluster VI (1858.65) followed by cluster VIII (1646.20) and cluster IV (1347.13) while cluster V (547.07) recorded lowest mean. The cluster mean values indicated that maximum variation was accounted by number of grains per earhead (87440.60) followed by plant height (154.40) and dry fodder weight per plant (135.66). The variance of cluster means also indicated that earhead girth (10.59) and earhead length (10.03) accounted minimum variation. The study indicated no relationship between genetic diversity and geographic

* Author for correspondence.