RESEARCH ARTICLE

VARIABILITY, CHARACTER ASSOCIATION AND PATH ANALYSIS STUDIES IN FORAGE SORGHUM

Akash Singh, S.K. Singh*, Pooran Chand, S.A. Kerkhi, Mukesh Kumar[1] and Raj Vir Singh[2]

Department of Genetics and Plant Breeding
[1]Department of Agricultural Biotechnology
[2]Department of Agronomy
Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut - 250 110
Email: shivkumar301968@gmail.com

Received-12.07.2017, Revised-24.07.2017

Abstract: Economic yield attributing characters were studied in forage sorghum for crop improvement through selecting high yielding characters. Significant variations were recorded among the genotypes for various yield traits studied. High values for phenotypic coefficient of variation (PCV) and genotypic coefficient of variation (GCV) was noted for plant height, leaf breadth, internode length and green fodder yield per plant. High heritability coupled with high genetic advance as percent of mean was revealed for plant height, leaf breadth, internode length, number of leaves per plant, leaf stem ratio, leaf area, total soluble solids and green fodder yield per plant. Green fodder yield per plant observed positive and significant correlation with plant height, number of leaves per plant, internode length, leaf area and protein content at both the levels. The result of path coefficient analysis showed that leaf area, leaf breadth, leaf length, plant height and protein content had positive direct effect on green fodder yield. Sorghum is one of the important food crops of the world. To exploit the potentiality of sorghum several crop improvement programmes have been undertaken. Yield is a complex character, which depends upon many independent contributing characters. Knowledge of the magnitude and type of association between yield and its components themselves greatly help in evaluating the contribution of different components towards yield. Yield being a polygenic character is highly influenced by the fluctuations in environment. Hence, selection of plants based directly on yield would not be very reliable. Improvement in sorghum yield depends on the nature and extent of genetic variability, heritability and genetic advance in the base population and besides the information on the nature of association between yield and its components helps in simultaneous selection for many characters associated with yield improvements. It was concluded that these characters could be considered as significant selection criteria for yield improvement in forage sorghum.

Keywords: *Sorghum bicolor*, Variability, Correlation, Path coefficient analysis

REFERENCES

Burton, G.W. (1952). Quantitative inheritance in grasses. Proc. 6th Int. Grassland Cong.1:227-283.

Dewey, D.R. and Lu, K.H. (1959). A correlation and path coefficient analysis components of crested wheat grass. *Journal of Agronomy*, 51: 515-518.

Diwakar, A., Ranwah, B.R., Sharma, D.B. and Sinha, S.K. (2016). Study of variability parameters in forage sorghum. *Research of Environment Life Science*, 9(5): 528-530.

Fisher, R.A. (1918). The correlation between relative on the supposition of mendelian inheritance. *Trans. Roy Soc. Edinburgh,* 52: 399-433.

Fisher, R.A. and Yates, F. (1938). Statistical table for biological, agricultural and medical research, 5 Auge. *Oliver and Boyd, Edinburgh*.

Jain, S.K., Elangovan, M. and Patel, N.V. (2017). Correlation and path coefficient analysis for agronomical traits in forage sorghum [*Sorghum bicolor* (L.) Moench] *Indian Journal. Plant Genet. Resour.*, 23(1): 15-18.

Jain, S.K. and Patel, P.R. (2013). Variability, correlation and path analysis studies in sorghum (*Sorghum bicolor* (L.) Moench). *Forage Research*, 39 (1): 27-30.

Johnson, H.W., Robinson, H.F. and Camstock, F. (1955). Genotypic and phenotypic correlation in soybean and their implications in selection. *Agron. J.*, 47: 477-483.

Malik, A., Singh, S.K., Chand, P., Singh, B. and Singh, D.K. (2015). Genetic variability, heritability and genetic advance studies on forage sorghum. *Progressive Agriculture* 15(1): 92-94.

Panse, V.G. and Sukhatme, P.V. (1967). Statistical methods for agricultural workers. *Indian Council of Agricultural Research*, New Delhi.

Ranjith, P., Ghorade, R.B., Kalpande, V.V. and Dange, A.M. (2017). Genetic variability, heritability and genetic advance for grain yield and yield components in sorghum. *International Journal of Farm Sciences*, 7(1): 90-93.

Robinson, H.F., Comstock, R.E. and Harvey, P.H. (1951). Genotypic and phenotypic correlation in corn and their implication in selection. *Agron. J.*, 43: 262-67.

Singh, S.K., Singh, A. and Kumar, R. (2016). Genetic variability, character association and path analysis in forage sorghum. *Progressive Agriculture* 16(2): 214-218.

*Corresponding Author