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Association of characters and path coefficient analysis for forage and related traits in bajra x napier grass hybrids

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SUMMARY

The correlation and path coefficients were worked out for forty derivatives of bajra x napier grass hybrids for green forage yield and twelve yield contributing characters. Green forage yield was significantly and positively associated with dry matter yield, crude protein yield, number of tillers and plant height. Path analysis revealed that characters *viz*., dry matter yield exhibited the highest positive direct effect on green forage yield followed by crude protein content, stem girth at IInd internode and plant height. Considering both, the correlation coefficients and path coefficients together, dry matter yield, plant height, and crude protein content emerged as important components of green forage yield which should be given due importance during indirect selection aimed at green forage yield improvement in bajra x napier hybrids.

Key words : Correlation, Path analysis, Green forage, Dry matter, Bajra x napier

Bajra x Napier grass hybrid is best suited to irrigated conditions. The inter specific hybrid (2n=3x=21) berween napier grass and pearl millet is found to be more nutritious, succulent, palatable and responsive to nitrogenous fertilizers than napier grass, and is reported to have given 2,79,400 kg per hectare of fodder as compared to 1,35,300 kg/ha given by the latter.

Yield is a complex character and selection made on the basis of its phenotypic expression alone is likely to be misleading. Yield in any crop is a multiplicative product function of various yield attributing plant characters. The knowledge of interrelationship among the yield components and especially with yield is, therefore, useful to the plant breeder for designing an effective selection programme. The correlation coefficients alone are inadequate to understand the cause and effect relationships. However, path analysis furnishes a method of partitioning the correlation coefficients between various characters into direct and indirect effects and provide the actual contribution of an attribute and its influence through other traits.

The present investigation was, therefore, undertaken to derive information on correlation coefficients and direct and indirect path effects of twelve independent components on green forage yield in forty derivatives of bajra x napier grass hybrids.

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MATERIALS AND METHODS

The material under investigation consisted of forty derivatives of bajra x napier grass hybrids maintained at Grass Breeding Scheme, MPKV, Rahuri. The experiment was conducted at Grass Breeding Scheme in a randomized block design with two replications for green forage yield and twelve yield contributing characters. Each genotype of bajra x napier grass hybrids was represented by two rows of 6m length. Spacing of 90 cm between rows and 60 cm between the plants within a row was maintained. After planting one irrigation was given and subsequent irrigations were given as an interval of 10-12 days. Top dressing of 25 kg of 'N' per ha was applied after each cut. Observations on characters except green forage yield, dry matter yield and crude protein yield were recorded on ten randomly selected plants in each experimental plot at the time of second cut and averages were worked out. Observations on green forage yield, dry matter yield and crude protein yield were recorded and expressed in kg/plant. First cut was taken 55 days after planting and subsequent cuts were taken at interval of 40 days. To obtain crude protein content (%) nitrogen percentage was determined by Microkjeldahl's method (Thimmaiah, 1999) and per cent nitrogen was multiplied by conversion factor 6.25. Oxalic acid content was measured as per the procedure given in standard methods of biochemical analysis (Thimmaiah, 1999). The data collected on individual characters were subjected to the method of analysis of variance commonly applicable to the Randomized Block Design (Panse and Sukhatme, 1967). The genotypic co-variances (Singh and Chaudhari, 1977), genotypic correlation coefficients (Johnson, *et al*., 1955) and path-coefficients (Dewey and Lu., 1959) were