Journal of Tropical Agriculture 38 (2000) : 35-37

GENETIC ANALYSIS OF YIELD AND ITS COMPONENTS IN FODDER TEOSINTE (*EUCHLAENAMEXICANA* L. SCHRAD)

D. I. Suma Bai and C. Lekha Rani
College of Agriculture, Vellayani 695522, Thiruvananthapuram, India

Abstract: Ten fodder teosinte types were evaluated in a randomized block design with three replications during Kharif 1995 at the College of Agriculture, Vellayani under AICRP on Forage Crops. Genetic analysis of fodder yield and its components revealed that plant height recorded high genotypic coefficient oi' variation, heritability and genetic advance indicating that selection based on this character will result in improving fodder yield. Highest genotypic correlation was observed between green fodder yield and dry matter yield. Leaf number per plant and plant stand recorded highest positive genotypic correlation with green fodder yield.

Key words: Additive gene, correlation, fodder teosinte, genetic advance, genetic variability, heritability.

INTRODUCTION

Teosinte is a quick growing drought tolerant fodder crop with versatile adaptation to varied soil types. The improvement of yield in any crop by selection depends upon the extent of genetic variability in respect of yield and its components. Correlation estimates are useful in determining how selection based on characters will result in an improvement of other correlated characters. Hence, this study was carried out to estimate genetic variability and correlation of different components of yield in fodder teosinte.

MATERIALS AND METHODS

The materials consisted of 10 fodder teosinte types viz., TL-16, TL-39, TL-40, TL-42, TL-43, TL-45, TL-50, TL-51, TL-54 and Improved Sirra. The study was conducted with the above 10 types in randomized block design with three replications during kharif 1995 at the College of Agriculture, Vellayani, Thiruvananthapuram under the All India Coordinated Research Project on Forage Crops. The cultural and manurial practices were done as per package of practices recommendations of the AICRP on Forage Crops. From each plot, a random sample of 10 plants was selected for recording plant height, tiller number per plant, leaf number per plant, leaf/stem ratio, green fodder yield and dry matter yield. In addition to the above. plant population was also recorded. The data were analyzed statistically and genotypic and phenotypic coefficients of variation (GCV and PCV) were calculated using the formula suggested by Burton (1952). Heritability in the broad sense (H^2) and genetic advance (GA) were calculated using the formula suggested by Allard (1960). The genotypic and phenotypic correlations were estimated as per Panse and Sukhatme (1961).

RESULTS AND DISCUSSION

The estimates of PCV, GCV, heritability and genetic advance are presented in Table 1. The phenotypic and genotypic coefficient of variation was maximum for green fodder yield (19.82 and 17.81) and minimum for plant population (9.49 and 6.30) respectively. High GCV values for green fodder yield, dry matter yield and leaf number per plant indicate high amount of genetic variability and scope for the improvement of these characters through selection. High heritability and high genetic advance reported for plant height was in agreement with the results of Sreekumar and Bai (1995) in fodder maize.

High heritability and low genetic advance observed for tiller number per plant and dry matter yield indicate the role of non-additive genes in the expression of these characters. High heritability-

Table 1. Genotypic and phenotypie coefficient of variation, heritability and genetic advance for different characters in fodder teosinte

Characters	GCV	PCV	H^2	GA
Plant population	6.30	9.49	44	7.74
Plant height	9.67	10.55	84	28.26
Leaf/stem ratio	6.68	14.30	22	3.76
Tiller number per plant	1 1.47	15.76	53	0.36
Leaf number per plant	13.26	19.03	45	2.34
Green fodder yield	17.81	19.82	81	8.32
Dry matter yield	17.69	19.74	81	2.89

Table 2. Phenotypie and genotypic correlation among characters

Characters		Plant height	Leaf/stem ratio	Tiller number per plant	Leaf number per plant	Green fodder yield	Dry matter yield
Plant stand	P	-0.08	0.12	-0.02	0.33	0.29	0.29
	G	-0.11	0.50	-0.45	0.58	0.35	0.35
Plant height	P	-	-0.12	-0.23	0.44	0.15	0.14
	G	-	-0.68	-0.38	0.58	0.15	0.14
Leaf/stem ratio	P	-	-	0.14	0.15	0.43	0.43
	G	-	-	0.29	0.21	0.13	0.14
Tiller number per plant	P	-	-	-	-0.41	-0.13	-0.12
	G	-	-	-	-0.87	-0.35	-0.35
Leaf number per plant	P	-	-	-	-	0.43	0.43
	G	-	-	-	-	0.74	0.74
Green fodder yield	P	-	-	-	•	-	1.00
	G	-	-	-	•	-	1.00

P = Phenotypie; G = Genotypic

and high genetic advance observed for plant height indicate additive gene and the reliability of this character during selection for improving the yield.

Phenotypie and genotypic correlations among characters are presented in Table 2. Green fodder yield and leaf number per plant were having highest positive genotypic correlation with dry fodder yield followed by plant stand and plant height. Tiller number per plant showed negative phenotypie and genotypic correlation with dry fodder yield. In the case of green fodder yield, maximum correlation was obtained with leaf number per plant and plant stand. Dry fodder yield had the highest positive genotypic correlation with green fodder yield in guinea grass (Babu, 1997). Dry matter yield and green fodder yield were positively correlated with number of leaves per plant (Patel and Sheika, 1998). Sewi *et al.* (1998) reported that green fodder yield was positively and significantly correlated with dry matter yield at the phenotypie level. In the present study, positive high genotypic correlation was observed between leaf number per plant and green fodder yield