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CORRELATION AND PATH ANALYSIS IN FODDER CHARACTERS OF LABLAB HYBRIDS

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ABSTRACT

Six genotypes of lablab (*Lablab purpureus* (L.) Sweet) along with their 30 hybrids obtained through diallel analysis were utilised for the estimation of genotypic correlations and path analysis for green fodder yield and its 11 yield contributing traits. The path coefficient analysis revealed highest direct effect of dry weight of leaf on green fodder yield. The quality traits *viz.*, crude protein and phosphorus content showed negative direct effect on green fodder yield.

KEY WORDS: Fodder Lablab, Correlation, Path Analysis

Forage legumes are of paramount importance to the Indian agriculture because of their nutritional quality with high crude protein, phosphorus and calcium contents in addition to the green fodder yield. The information on association between components of forage yield and cause and effect relationship between green fodder yield and its attributes in forage lablab is very essential since selection of such yield attributing traits will result in the rapid improvement of yield. Hence, the present investigation was carried out to find out the nature and extent of association among the different characters.

MATERIALS AND METHODS

Six genotypes of lablab *viz.*, CO 9, CO 2, CO 1, DPI 1281, DL 3196 and MS 9495 were chosen based on the favourable phenotypic fodder characteristics from the germplasm maintained at the Department of Pulses, Tamil Nadu Agricultural University, Coimbatore. Thirty hybrid combinations were obtained from six parents through crossing in all possible combinations n(n-1) as suggested by Griffing (1956) model 1 and method 1. All the 30 hybrids along with 6 parents (selfs) were raised in a randomised block design replicated thrice during the first week of March, 1994 summer season at the Agricultural College and Research Institute, Killikulam. Each treatment was grown in a single row of 5 m length with a spacing of 45 x 30 cm under irrigated condition. All the agronomic practices were carried out according to the standard recommendations. Observations for 12 biometrical traits were

Table 1. Genotypic correlation coefficients among biometrical traits

Characters	Primary branches per plant	Secondary branches	Number of leaves per plant	Specific leaf weight	Dry weight of leaf per plant	Dry weight of stem per plant	Leaf : stem ratio	Crude protein content	Phosphorus content	Dry matter yield	Green fodder yield
Plant height	0.483**	0.666**	0.412**	-0.047	0.746**	0.790**	0.385**	0.841**	0.054	0.744*	0.582*
Primary branches per plant		0.535**	0.316**	0.072	0.426**	0.488**	0.195	0.475**	0.198**	0.482**	0.449*
Secondary branches per plant			0.220**	-0.099	0.615**	0.723**	0.254**	0.638**	0.162	0.694**	0.350*
Number of leaves per plant				0.064	0.705**	0.483**	0.594**	0.070	0.120	0.426**	0.831*
Specific leaf weight					0.036	0.057	-0.007	-0.126	0.082	0.118	0.181
Dry weight of leaf per plant						0.829**	0.758**	0.483**	0.199**	0.810**	0.845*
Dry weight of stem per plant							0.275**	0.642**	-0.097	0.887**	0.679*
Leaf : Stem ratio								0.140	0.481**	0.354**	0.615
Crude protein content									0.071	0.578**	0.19
Phosphorus content										0.111	0.10
Dry Matter yield											0.692

* Significant at 5 per cent level; ** Significant at 1 per cent level

Table 2. Path coefficient analysis showing direct and indirect effect of yield components on green fodder yield

Chara-cters	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	Genotypic correlation with green fodder yield
X1	0.247	0.109	-0.142	0.068	-0.003	2.015	-1.051	- 0.472	-0.220	-0.001	0.031	0.582**
X2	0.119	0.227	-0.114	0.052	0.005	1.152	-0.648	- 0.239	-0.124	-0.001	0.020	0.417**
X3	0.165	0.121	-0.213	0.036	-0.007	1.661	-0.962	- 0.311	-0.167	-0.001	0.029	0.346**
X4	0.101	0.071	-0.046	0.165	0.004	1.905	-0.642	- 0.728	-0.018	-0.001	0.018	0.831**
X5	-0.011	0.016	0.021	0.010	0.075	0.097	-0.076	0.009	0.033	-0.001	0.005	0.181
X6	0.184	0.096	-0.131	0.116	0.002	2.703	-1.102	- 0.930	-0.126	-0.002	0.346	0.845**
X7	0.195	0.110	-0.154	0.079	0.004	2.240	-1.330	- 0.337	-0.168	-0.001	0.037	0.679**
X8	0.095	0.044	-0.054	0.098	-0.001	2.050	-0.365	- 1.226	-0.036	-0.004	0.015	0.615**
X9	0.208	0.107	-0.136	0.011	-0.009	1.306	-0.854	- 0.171	0.291	-0.001	0.024	0.195
X10	0.013	0.044	-0.034	0.019	0.006	0.5371	0.128	- 0.590	-0.018	-0.009	0.004	0.101
X11	0.184	0.109	-0.143	0.070	0.008	2.190	-1.179	- 0.433	-0.151	-0.001	0.042	0.692**

Underline figures indicate direct effects

X1 : Plant height X2 : Primary branches per plant X3 : Secondary branches per plant X4 : Number of leaves; X_5 : Specific leaf weight X6 : Dry weight of leaf X7 : Dry weight of stem X8 : Leaf : Stem ratio X9 : Crude protein content X10 : Phosphorus content X11 : Dry matter yield Residual effect : 0.2834

* Significant at 5 per cent level; ** Significant at 1 per cent level

recorded on 5 randomly selected plants in each genotype. Correlation coefficients (Al-Jibouri *et al.*, (1958) and path analysis (Dewey and Lu, 1959) were estimated.

RESULTS AND DISCUSSION

Genotypic correlation coefficients between various yield attributing traits are presented in Table 1. Estimates of genotypic correlation revealed that all the characters showed significant positive correlation with green fodder yield except for specific leaf weight, crude protein and phosphours content. Positive association between green fodder yield and number of leaves, dry weight of leaf, specific leaf weight and dry weight of stem was reported by Thaware *et al.* (1992). Dry matter yield exhibited positive correlation with the green fodder yield. Dry weight of leaf contributed the maximum direct effect on green fodder yield as per path coefficient analysis (Table 2). Its effect was further increased by the positive indirect effect via plant height, number of primary branches, number of leaves, specific leaf weight and dry matter yield but negative indirect effects through secondary branches per plant, dry weight of stem, leaf:stem ratio. This is similar to the findings of Dangi and Paroda (1974).

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