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CORRELATIONS AND PATH COEFFICIENT ANALYSIS IN FENUGREE

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ABSTRACT

Fifty diverge genotypes of fenugreek (Trigonella foenum graecum L.) revealed highly significant differences for morphological characters. Phenotypic and genotypic correlation showed similar trend but genotypic correlations were of higher magnitude than phenotypic. Plant height, branches per plant, pods per plant, 100-grain weight and protein content showed significant positive correlation with grain yield per plant. Path analysis revealed that plant height, number of pods per plant, number of seeds per pod and test weight are of utmost importance for contributing yield per plant in fenugreek.

KEY WORDS: Fenugreek, Correlations, Path Analysis

Fenugreek (Trigonella foenum graecum L.) is an important spice crop. It is gaining much importance as a medicine. It grows well in saline soils. Yield is a complex character and is dependent on a number of components. Information on the association of different characters among themselves and their relationship with yield are of utmost importance for making selection. Path coefficient analysis measures direct influence of a variable upon another and permits separation of correlation coefficients into components of direct and indirect effects.

MATERIALS AND METHODS

Fifty varieties of fenugreek collected from different agro-climatic zones of country were

grown in randomised block design in single row plot of 4m length and 40 x 10 cm spacing with three replications. Data were recorded at maturity on ten randomly selected plants for each variety in each replication and means of 30 plants over three replications were used for analysis. Phenotypic and genotypic correlations were studied and path analysis among characters was calculated (Rao, 1952).

RESULTS AND DISCUSSION

The correlation at genotypic and phenotypic level in general showed the same trend (Table 1). Genotypic correlations were generally higher than phenotypic. Grain yield per plant exhibited significant positive correlation with plant height,

Table 1. Genotypic (G) and phenotypic (P) correlation coefficients between different characters in fenugreek

			1 7 1	1000						* · · · *	
Characters		Plant height	Days to flowering	Days to maturity	Branches -per plant	Pods per plant .	Pod length	100 grain weight	Grains per pod	Protein content	Yield per plant
Plant .	G	, - ,	-0.3124*	-0.2832*	0.4768**	0.1466	0.5527**	0.4060**	-0.0286	-0.0853	0.4853**
height	P	ž.	-0.2050	-0.1677	0.2403	0.1600	0.3897**	0.2519	-0.0323	-0.1050	0.3742**
ays to	G	-	4	0.9209**	-0.6287**	-0.1912	-0.1900	-0.7342**	0.1388	-0.0094	-0.5665**
nwering	P	•••	-	0.7822**	-0.3689**	-0.1471	-0.0408	-0.5183**	0.0535	-0.0862	-0.3234**
ys to	G	1	.4	2.1	-0.4210**	-0.1615	-0.2020	-0.6897**	0.1443	0.0309	-0.6056**
aurity	P	-		÷·	-0.1762	-0.0901	-0.0261	-0.4366**	0.1087	-0.0803	-0.3106*
anches	G	. *	.*	• :	-	0.5373**	0.2122	0.3748**	-0.1941	-0.0056	0.7793**
er plant	P	٠.		<i>-</i>	÷	0.4107**	0.2198	0.1860	0.0354	0.0085	0.4678**
ods per	G	**	ve.	. • : *	*:		0.0125	0.0429	0.2899**	0.0887	0.6874**
ant	P		(•, °;	10 m		1.	0.1178	0.0018	0.1295	0.0723	0.5367**
od lengthG		23	· .	344	2	F.		0.3206*	-0.1613	-0.0590	0.4597**
	p	*						0.1410	0.0433	-0.0714	0.2931**
100 grain	G	-		: +:	-:	6e. "		(- w ₂	-0.0947	0.0330	0.5414**
weight	P	*	, Se	**:	• :	7.	7 m	<u>.</u> :	-0.0920	0.0451	0.32875
Grains per G		51	:*:		•2	:=:	· • ·	*		-0.1195	0.1217
pod	P		**		• <u>`</u>			**	- 2	-0.1364	-0.0057
Protein	G	. ·		12		-	4.1	_'	4	1.1	0.35611
content	P		1	4	*.						10-

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Table 2. Path coefficient analysis indicating direct and indirect effects of various components on grain yield per plant in fenugreek

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Characters	Direct effects	Plant height	Days to flowering	Days to maturity	Branches per plant	Pods per plant	Pod length	100 grain weight	Grains per pod	Protein content	Conclution coefficient
Plant height	-0.7440	•	-1,2696	0.9259	1.2250	-0.1021	0.2531	0.2234	0.0272	-0.0537	0.4853**
Days to flowering	4.0638	0.2324	٠.	-3.0106	-1.6151	0.1332	-0.0870	-0.4005	0.1322	-0.0059	-0.5665**
Days to maturity	-3.2692	0.2107	3.7423	8)	-1.0815	0.1124	-0.0925	-0.3846	0.1374	0.0195	-0.60,56**
Branches per plant	2.5691	-0.3547	-2.5548	1.3763	1,2	-0.3743	0.0971	0,2020	-0.1849	-0.0035	0.7793**
Pods per plant	-0.6966	-0.1090	-0.7771	0.5278	1.3804	:€	0.0057	0.0239	0.2762	0.0599	0.6874**
Pod length	0,4580	-0.4111	-0.7720	0.6605	0.5451	-0.0087	-	0.1788	-0.1536	-0.0371	0.4597==
100 grain weight	0.5577	-0.2980	-2.9835	2.2548	0.9628	-0.0298	0.1468	•	-0.0902	0.0207	0.5414**
Grains per pod	0.9531	-0.0212	0.5640	-0.4716	-0.4986	-0.2019	-0.0738	-0.0527		-0.0753	0.1217
Protein content	0,6305	0.0634	-0.0382	-0.1016	-0.0143	-0.0618	-0,0270	0.0183	-0.1138	+ 🕸	0.3536**

Residual effect = 0.6929 ** Significant at 1% level; * Significant at 5% level

branches per plant, pods per plant, pod length and 100-grains weight at genotypic and phenotypic level. Negative association between grain yield per plant and protein content was reported (Pant et al, 1984). However, in present studies, positive association was observed between these traits indicating that selection for grain yield will be beneficial to achieve high protein content.

Grains per pod did not exhibit any significant association with grain yield per plant. Characters like days to flowering and days to maturity showed significant negative association with grain yield per plant. This indicates that any attempt to increase grain yield will adversely affect the days to flowering and maturity. In such cases, it is suggested that attempts can be made to break this undesirable linkage through hybridisation.

Path analysis is useful in partitioning the direct and indirect association among attributes and detail examination of specific forces acting to produce a given correlation and measure the relative importance of each casual factor. Hence such studies provide a realistic basis for allocation of weightage to each attribute in deciding suitable criterian for selection (Singh et al., 1968; Sandhu et al., 1979). Estimates of direct and indirect effects

of yield per plant showed that there was direct positive effect of 100-grain weight, grains per pod, pod length and branches per plant. Also the indirect effect of other traits were mainly through the above traits (Table 2). Though protein content also had positive correlation with grain yield per plant, its contribution was mainly through plant height and 100-grain weight.

Thus selection in fenugreek should be done for tall plant, more number of pods and seeds per pod with high test weight for maximum yield with high protein content.

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