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PATH ANALYSIS IN GREEN GRAM *(PHASEQLUS AUREUS* ROXB.)

P. SARASWATHY, S. G. SREEKUMAR and E, J. THOMAS

College of Agriculture, Vellayani, Kerala

Yield is a complex character influenced by various components that contribute towards the genetic potential of the crop. The success in any breeding programme depends on the closeness of the configuration of those components in the plant type evolved, to the optimal configuration that gives full expression to the genetic potential of the crop. To achieve this, it is necessary to study and quantify the effects of these components on yield either directly or through some other component. Hence the path of influence as well as the measure of the intensity of influence are to be understood. The present study was undertaken with a view to determining the path of influence as well as their intensities in green gram at least in a preliminary manner with the objective of utilising the information in designing a breeding programme.

Materials and Methods

Fifteen different genotypes (5 Parents and 10 F_1 hybrids), were grown in a Randomised Block Design with 3 replications. Five plants selected at random from each plot were used for recording observations on number of clusters, length of pod, number of pods/plant, number of seeds/pod, 100 seed weight, number of branches, height of plants and yield. The method employed by Durate and Adams (1972) in field beans was adopted to find out the cause effect relationship.

In the model for path analysis the first order components were taken as the number of clusters, length of pod and the number of pods, which were assumed to be mutually inter correlated. The second order ccmponents were taken as the number of branches, number of seeds/pod and 100 seed weight. Number of branches was assumed to have influence on number of clusters, number of seeds/pod and 100 seed weight.

Results and Discussion

The genotypic correlations of yield and other 7 component characters studied are presented in table 1. The direct and indirect effect of first and second order components on yield are presented in Table 2 and 3 respectively. Among the first order components number of clusters contributed maximum positive direct effect on yield. Further the influence of number of clusters

Table 1 Genotypic correlations among various characters and yield in greengram.

	No. of clusters	Length of pod	No. of pods	No. of seeds/pod	100 seed weight	No. of branches	Height	Yield
No. of Clusters	–	0.8421*	0.8456**	0.0986	-0.3950*	0.7388**	0.6757**	0.7372**
Length of pod	–	–	0.5872**	0.8404**	0.5962*	0.5781*	0.9972**	0.3984**
No of pods	–	–	–	0.1790	0.0119	0.7015**	0.8918**	0.5928**
No. of seeds/pod	–	–	–	–	0.3290	0.2732	0.6215**	0.1166
100 seed weight	–	–	–	–	–	0.0758	0.5485**	0.1513
No. of branches	–	–	–	–	–	–	0.6311**	0.5978**
Height	–	–	–	–	–	–	–	0.6329**

* Significant at 5% probability level. ** Significant at 1% probability level.

was increased through the indirect effect of length of pod. This high positive direct effect of number of clusters was reduced to a certain extent through the number of pods. Significant positive correlation of yield with number of clusters, length of pod and number of pods was recorded. Length of pod and number of clusters had high positive direct effect on yield. Whereas the indirect effect of number of pods was negative. 77% of the variation in yield was attributable to the number of clusters, length of pod and number of pods. The result showing positive correlation of yield with cluster number and pod length are in conformity with Singh and Malhotra (1970) and Malhotra *et al* (1974).

Table 2 Direct and indirect effects of first order components on yield

	No. of clusters	Length of pod	No. of pods	Total correlation
No: *of* clusters	0.9864*	0,1017	—0.3509	0.7372
Length of pod	0.3276	0.3062*	—0.2354	0.3934
No. of pods	0.8341	0.1737	—0.4150*	0.5928

* ' Figures denote the direct effects.

Table 3 Direct and indirect effect of second order components on length of pod

	No. of seeds/pod	100 seed weight	Total correlation
No. of seeds/pod	0.7314*	0,1170	0.8484
100 seed weight	0.2406	0.3556	0.5962

* Figures denote the direct effects.

Among the second order components positive genotypic correlations were recorded between yield and number of seeds per pod and 100 seed weight. Positive correlation noticed between yield and 100 grain weight was contrary to the finding of Girija and Vijayakumar (1974) and Malhotra *et al* (1974) and is in conformity with that of Gupta and Singh (1969) and Singh and Malhotra (1970). The positive association between yield and number of seeds/pod confirmed the result of Singh and Malhotra (1960). The number of seeds/pod and 100 grain weight together explained 83% of the variability in

length of pod. The number of seeds/pod had positive direct effect of 0.7314 and 100 seed weight had a direct effect of 0.3556.

Among the 3rd order components height had a direct effect of 0,6311 on number of branches. Positive correlation recorded between height and yield is in confirmity with that of Girija and Vijayakumar (1974). It is concluded from path analysis that number of clusters, length of pod, number of pods, number of seeds/pod and 100 seed weight are the major yield components in greengram.

സംഗ്രഹം

പതിനഞ്ചു് വ്യത്യസ്ത ജനസ്സുകളിൽപ്പെട്ട ചെറുപയറിനങ്ങളുടെ വിളവും അതുമായി ബന്ധപ്പെട്ട ഏഴു് ജനികഘടകങ്ങളും തമ്മിലുള്ള പരസ്പരബന്ധം സഹസംബന്ധ ഗുണാംക (Correlation Coefficient) പഠനത്തിനു വിധേയമാക്കി ഈ ഘടകങ്ങളുടെ പഥഗുണാംകം (Path Coefficients) പരിശോധിച്ചാൽ കുലകളുടെ എണ്ണം, കായുടെ എണ്ണം, കായുടെ നീളം, fflosoa കായിലുംഉള്ള മണികളുടെ എണ്ണം, 100 മണികളുടെ തൂക്കം എന്നിവ വിളവിന്റെ പ്രധാന ഘടകങ്ങളാണെന്നു കാണാം. അതിനാൽ ഇവയുടെ അഭിവൃദ്ധിപ്പെടുത്തൽ വിളവു് വർദ്ധനവിനു സഹായിക്കും.

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