Annals of Arid Zone 35(2) : 163-164, 1996

Short Communication

Path Analysis of Yield and Yield Components in Clusterbean

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Clusterbean (*Cyamopsis tetragonoloba* (L.) Taub.), a drought hardy crop fits well in existing rainfall pattern of the arid regions. Thus, arid and semi-arid regions of Rajasthan are the main areas of its cultivation for vegetable and grain purposes. Path coefficient analysis provides an effective means of partitioning direct and indirect causes of association. Hence, the present study was undertaken to judge the direct and indirect effects of various traits on seed yield.

Eighty-one genotypes of clusterbean were grown at Mandor during rainy season of 1993 in a randomized block design with 3 replications. Each plot comprised of two rows of 3 m length, with 45 cm space between the rows. Plant-to-plant distance within rows was 15 cm. Observations were recorded on five random plants from each plot. Path coefficient analysis was computed following Dewey and Lu (1959).

The results of association analysis indicated that the traits, viz., pods plant^{-1}, pods cluster^{-1} and clusters plant^{-1} were significantly and positively correlated with seed yield plant^{-1} (Table 1). The direct effects obtained in path analysis showed that number of pods plant^{-1} was the most important component of seed yield because it had relatively large positive and direct influence on yield. This direct contribution to yield was further reinforced by its indirect effect through pods cluster^{-1} and clusters plant^{-1}. Nath and Saini (1980) also reported maximum direct positive effect of pods plant^{-1}. Whereas, Sidhu *et al.* (1982) observed only slight positive direct influence of this trait on yield.

The magnitude of direct effect of 1000-seed weight was next to pods plant^{-1} followed by the pods cluster^{-1}, seeds pod^{-1} and clusters plant^{-1}. Choudhary and Singh (1976) reported higher positive direct effect for clusters plant^{-1}, peduncle length, pods plant^{-1} and 1000-seed weight upon seed yield. It is interesting to note that direct effect of characters, viz., pods cluster^{-1} and clusters plant^{-1} were further strengthened through their indirect contribution, viz., pods plant^{-1}, where as, direct contribution of other traits, viz., 1000-seed weight and seeds pod^{-1} were reduced due to their indirect negative influence through pods plant^{-1}, clusters plant^{-1} and pods cluster^{-1} resulting in their non-significant association with seed yield. The highest negative direct effect was observed for plant height on seed yield followed by days to maturity and branches plant^{-1}.

It may be concluded that selection based on pods plant^{-1}, clusters plant^{-1} and pods cluster^{-1} would lead to further improvement in seed yield of clusterbean under rainfed conditions.

Table 1. Path coefficient analysis showing the direct (diagonal) and indirect effects of nine characters on seed yield in clusterbean

Character	Days to flowering	Days to maturity	Plant height (cm)	Branches plant^{-1}	Pods plant^{-1}	Clusters plant^{-1}	Pods cluster^{-1}	Seeds pod^{-1}	1000-seed weight (g)	Genotypic correlation with seed yield plant^{-1}
Days to flowering	0.073	-0.052	-0.094	-0.010	0.159	0.017	0.070	-0.012	-0.178	-0.027
Days to maturity	0.062	-0.062-	-0.098	-0.005	0.093	0.000	0.056	-0.017	-0.109	-0.081
Plant height (cm)	0.049	-0.043	-0.142	0.001	0.255	0.038	0.078	-0.042	-0.054	0.141
Branches plant^{-1}	0.011	-0.005	0.003	-0.062	0.219	0.106	-0.019	-0.021	-0.044	0.187
Pods plant^{-1}	0.016	-0.008	-0.050	-0.019	0.726	0.116	0.223	-0.067	-0.075	0.862**
Clusters plant^{-1}	0.006	0.000	-0.025	-0.031	0.395	0.212	-0.089	-0.031	-0.089	0.348**
Pods cluster^{-1}	0.014	-0.010	-0.031	0.003	0.450	-0.052	0.360	-0.071	-0.077	0.586**
Seeds pod^{-1}	-0.003	0.004	0.021	0.005	-0.173	-0.023	-0.091	0.281	-0.016	0.004
1000 seed weight (g)	-0.032	0.017	0.019	0.007	-0.134	-0.047	-0.068	-0.011	0.407	0.158

References

Choudhary, B.D. and Singh, V.P. 1976. Studies in variability, correlation and path analysis in guar. *Forage Research* 2: 97-102.

Dewey, D.R. and Lu, K.H. 1959. A correlation and path coefficient analysis of components of crested wheat grass seed production. *Agronomy Journal* 51: 515-518.

Nath, R. and Saini, M.L. 1980. Correlation and path coefficient analysis in clusterbean (*Cyamopsis tetragonoloba* (L.) Taub.). *Forage Research* 6: 1-5.

Sidhu, A.S., Pandita, M.L., Arora, S.K. and Vashistha, R.N. 1982. Studies on genetic variability and correlation coefficient in clusterbean. *Haryana Agricultural University Journal of Research* 12(2): 225-230.