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## Correlation coefficient analysis study in *Dolichos* bean (*Lablab purpureus* L.)

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### Abstract

The investigation was laid out in RBD with three replication during *kharif*- 2016 at the Horticulture research farm, Department of Horticulture SHUATS, Allahabad located in South-East part (Zone 4) of Uttar Pradesh. Green pod yield per plant was significantly positive correlated with 100 seed weight, pod length, pod width, pod per inflorescence, seeds per pod, pod weight, vine length, number of green pod picking and days to last green pod harvest, at genotypic as well as phenotypic level. Hence direct selection for these traits may lead to the development of high yielding genotypes of *Dolichos* bean. Inflorescence length exhibited highly significant and positively correlated with number of flowers per inflorescence, days to last green pod harvest. Number of flowers per inflorescence exhibited highly significant and positively correlated with number of pods per inflorescence. Number of flowers per inflorescence exhibited highly significant and positively correlated with number of pods picking, green pod yield per plant, 100 seed weight.

**Keywords:** *Dolichos* bean [*Lablab purpureus* L.] pod and seed yield and character association

### Introduction

*Dolichos* bean or Hyacinth bean or Egyptian bean or Sem (*Lablab purpureus* L.) is an important legume vegetable crop throughout India and distributed in Madhya Pradesh, Uttar Pradesh, Maharashtra, Chhattisgarh, Andhra Pradesh, Tamil Nadu and North Eastern states. It is known as poor's man bean (Ismunandji and Arsyad, 1990) [6]. It belongs to the family *Fabaceae*, sub family *Faboideae*, tribe *phaseoleae* and sub tribe *phaseolineae*.

It is one of the most ancient crops known for its food and fodder value. *Dolichos* bean has chromosome number  $2n=2x=22$ . It is grown on almost all types of soil of average fertility as in case of other beans (Nath, 1976) [8]. *Dolichos* bean is a perennial herbaceous plant often grown as an annual mainly grown for its young pod and green immature seeds for vegetable purpose. The dry seeds are also used for various vegetable preparations. The foliage of the crop provides hay, silage and green manure and cover crops (Smith, 1976) [14]. Association analysis gives an idea about relationship among the various characters and determines the component characters, on which selection can be used for genetic improvement in the pod yield. The yield components may not always be independent in their nature but may be interlinked. The degree of association between independent and dependent variables was first suggested by (Galton, 1888) [5], its theory was developed by (Pearson, 1904) [12] and their mathematical utilization at phenotypic, genotypic and environmental levels was described by (Searle, 1961) [13].

### Materials and Methods

The experiment will be carried out at the Horticulture Research Farm, Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad. Thirty genotypes of *Dolichos* bean were grown in a randomized block design with three replications. The sowing of experimental material was done on 31/07/2015 during the year 2015-2016. The seeds were sown in lines 1.5 m apart @ 10-12 kg seeds per ha. A gap of 1 m was kept in between two genotypes sown in the bed. Number of plants per plot was 8. Recommended dose of fertilizers *i.e.* 20:60:60 N: P2O5:K2O kg/ha and other cultural package of practices along with bamboo staking were adopted for better crop growth. Five competitive plants were selected at randomly tagged from each plot to record observation on various characters. The average value of each character was calculated on the basis of five plants for each genotype in every replication.

**Result**

Analysis of variance presented in showed that the genotypes differed significantly for all the 17 characters and the mean performance of 38 genotypes.

These findings are in general agreement with the findings of Pandita *et al.* (1980) [1], Wahabuddin *et al.* (1986) [17], Borah *et al.* (1992) [3], Bendal *et al.* (2008) [2], Upadhyay (2008) [15] and Patel (2010) [11].

Days to first flowering exhibited highly significant and positively correlated with days to 50% flowering (0.9970) followed by days to first green pod harvest (0.9768).

Days to 50% flowering exhibited highly significant and positively correlated with days to first green pod harvest (0.9697) while significant and negatively correlated with pod length (-0.361).

Inflorescence length exhibited highly significant and positively correlated with number of flowers per inflorescence (0.3116), days to last green pod harvest (0.2009), while non-significant and positively correlated with vine length (0.1306), pod width (0.0978), number of pods per inflorescence (0.0624).

Number of flowers per inflorescence exhibited highly significant and positively correlated with number of pods per inflorescence (0.7583), while non-significant and positively correlated with number of pods picking (0.2442), green pod yield per plant (0.1898), days to first green pod harvest(0.1771), pod length(0.0178), 100 seed weight (0.1383), vine length (0.0344).

Days to first green pod harvest is non-significant and positively correlated with days to last green pod harvest(0.1641), vine length(0.0546), while significant and negatively correlated with pod length(-0.2481), pod weight (-0.1982).

Days to last green pod harvest is highly significant and positively correlated with 100 seed weight (0.3456), vine length (0.2224), while significant and negatively correlated with pod width (-0.3262), Green pod yield per plant (-0.2328).

Number of green pod pickings is highly significant and

positively correlated with number of seed per pod (0.3800), vine length (0.3598), Green pod yield per plant (0.2588), while non-significant and positively correlated with 100 seed weight (0.2216), pod length (.1689), pod weight (0.0271).

Pod length is highly significant and positively correlated with number of seed per pod (0.7321), pod weight (0.5292), 100 seed weight (0.5097), Green pod yield per plant (0.5083), vine length (0.3284), while non-significant and positively correlated with pod width (0.0439).

Pod width is highly significant and positively correlated with pod weight (0.6024), green pod yield per plant (0.4631), while non-significant and positively correlated with number of seeds per pod (0.1550).

Pod weight is highly significant and positively correlated with number of seeds per pod (0.5297) green pod yield per plant (0.4849), vine length (0.1984), while non-significant and positively correlated with 100 seed weight (0.1709).

Number of seeds per pod is highly significant and positively correlated with Green pod yield per plant (0.5962), 100 seed weight (0.3922), and vine length (0.3555).

Vine length is highly significant and positively correlated with Green pod yield per plant (0.3613), 100 seed weight (0.2296).

100 seed weight is highly significant and positively correlated with green pod yield per plant (0.3492).

Green pod yield per plant was significantly positive correlated with seeds per pod (0.59), pod length (0.50), pod weight (0.48), pod width (0.46), pod per inflorescence (0.39), vine length (0.36), 100 seed weight (0.34), number of green pod picking (0.25) while non-significant and positively correlated with number of flower per inflorescence (0.18).

Similar result was observed by Patel *et al.*, (2014) for pod length, number of seeds per pod, 100 seed weight, and days to last green pod harvest. The experimental findings on correlated coefficient analysis are in general agreement with the result reported by Baswana *et al.*, (1980) [1], Pandita *et al.*, (1980) [1], Pandey *et al.*, (1980) [9], Dahiya *et al.*, (1991) [4], Upadhyay *et al.*, (2011) [16] and Kiran *et al.*, (2014) [7].

**Table 1:** Genotypic Correlations coefficient of yield and its attributing traits of *Dolichos* bean

S. N.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1.000	0.995**	-0.028	0.317	0.108	0.991**	0.101	-0.084	0.126	-0.353	-0.013	-0.298	-0.264	-0.133	0.291	-0.196
2		1.000	-0.013	0.306	0.118	0.996**	0.115	-0.069	0.143	-0.362*	-0.029	-0.319	-0.261	-0.143	0.295	-0.207
3			1.000	0.534**	0.158	-0.0009	0.223	0.158	0.268	-0.012	0.144	0.156	0.056	-0.065	0.322	-0.041
4				1.000	0.337	0.302	0.183	0.166	0.139	-0.168	-0.115	-0.325	-0.187	-0.101	0.281	-0.179
5					1.000	0.144	0.072	0.463**	0.421*	0.313	-0.087	0.058	-0.041	0.490**	-0.430*	0.374*
6						1.000	0.111	-0.060	0.154	-0.340	-0.032	-0.295	-0.261	-0.120	0.289	-0.202
7							1.000	0.702**	0.339	-0.044	-0.260	-0.172	0.201	0.379*	0.241	0.014
8								1.000	0.400*	0.391*	-0.140	0.214	0.292	0.666**	-0.111	0.228
9									1.000	0.234	-0.139	-0.020	0.066	0.224	-0.101	0.240
10										1.000	-0.025	0.283	0.371*	0.570**	-0.309	0.485**
11											1.0000	0.633**	0.1745	-0.066	-0.168	0.459**
12												1.000	0.247	0.242	-0.263	0.328
13													1.000	0.302	-0.062	0.337
14														1.000	-0.439*	0.573**
15															1.000	-0.604**
16																1.000

1. Days to first flowering, 2. Days to 50% Flowering, 3. Inflorescence length, 4. No. of flowers per inflorescence, 5. No. of pods per inflorescence, 6. Days to first green pod harvest, 7. Days to last green pod harvest, 8. No. of green pod Picking, 9.Vine length, 10. Pod length, 11. Pod width, 12. Pod weight, 13. No. of seeds per Pod, 14. 100 seed Weight, 15. YBMV incidence, 16. Green pod yield per plant

**Table 2:** Phenotypic correlation of coefficient of pod yield and its contributing traits of *Dolichos* bean

S.N.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1.000	0.992**	-0.029	0.302	0.101	0.988**	0.101	-0.080	0.119	-0.350	-0.013	-0.297	-0.216	-0.132	0.266	-0.182
2		1.000	-0.013	0.293	0.110	0.994**	0.114	-0.058	0.135	-0.360	-0.029	-0.314	-0.215	-0.142	0.269	-0.192
3			1.000	0.500**	0.142	-0.001	0.224	0.142	0.239	-0.013	0.143	0.152	0.045	-0.065	0.295	-0.026
4				1.000	0.303	0.291	0.175	0.123	0.122	-0.158	-0.110	-0.303	-0.134	-0.098	0.252	-0.179
5					1.000	0.134	0.072	0.331	0.353	0.283	-0.081	0.052	0.0003	0.451*	-0.390*	0.319
6						1.000	0.109	-0.051	0.142	-0.338	-0.032	-0.292	-0.209	-0.119	0.264	-0.188
7							1.000	0.592**	0.312	-0.042	-0.259	-0.170	0.162	0.375*	0.215	0.007
8								1.000	0.271	0.334	-0.119	0.193	0.258	0.568**	-0.109	0.193
9									1.000	0.213	-0.130	-0.023	0.054	0.212	-0.101	0.213
10										1.000	-0.025	0.277	0.305	0.565**	-0.279	0.447*
11											1.000	0.626**	0.143	-0.066	-0.154	0.430*
12												1.000	0.216	0.239	-0.255	0.299
13													1.000	0.240	-0.064	0.2970
14														1.000	-0.405*	0.540**
15															1.000	-0.548**
16																1.000

1. Days to first flowering, 2. Days to 50% Flowering, 3. Inflorescence length, 4. No. of flowers per inflorescence, 5. No. of pods per inflorescence, 6. Days to first green pod harvest, 7. Days to last green pod harvest, 8. No. of green pod Picking, 9. Vine length, 10. Pod length, 11. Pod width, 12. Pod weight, 13. No. of seeds per Pod, 14. 100 seed Weight, 15. YBMV incidence, 16. Green pod yield per plant

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