



CORRELATION AND PATH ANALYSIS STUDIES OF YIELD AND YIELD COMPONENTS IN BRINJAL

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Abstract

Correlation coefficient analysis in 84 varieties of brinjal revealed that the association of number of flowers per cluster, number of fruits per cluster, average fruit length and number of fruits per plant with fruit yield and among themselves was positive and highly significant and these traits were identified as yield components. The genetic improvement of fruit yield thus can be obtained by direct selection of these yield components. Path coefficient analysis revealed that the characters *viz.*, fruit set percentage, fruit weight, number of fruits per plant, relative style length, number of flowers per cluster and number of fruits per cluster had high direct and correlation values. Thus, the fruit yield per plant can be improved by making selection of these characters during yield improvement programme.

Key words: Brinjal, genotypic correlation, phenotypic correlation, path analysis.

Introduction

Brinjal (*Solanum melongena* L, 2n = 24) belonging to family Solanaceae. is one of the most important and popular vegetable crop grown round the year all over the country. The fruit is employed as cure for toothache and recommended as remedy for liver complaints. In Unani. roots are used to alleviate pain. Fruits are used as cardio tonic, laxative and reliever of inflammation. There is an increasing demand for its varieties, which are used for different preparations.

Yield is a complex character influenced by several genetic factors interacting with environment. Success of any breeding programme for its improvement depends on the existing genetic variability in the base population and on the efficiency of selection. For a successful selection, it is necessary to study the nature of association of the character in question with other relevant traits and also the genetic variability available for them. Path coefficient provides a better index for selection rather than mere correlation coefficient by separating the correlation coefficient of yield and its components into direct and indirect effects. Therefore, the present study was undertaken with the objective to understand the character association among the various traits and their direct and indirect effects on yield in brinjal. The information on such aspects can be of great help in

formulating appropriate breeding strategy for genetic up-gradation of this commercial vegetable crop.

Materials and Methods

The experimental material consisted of eighty four germplasm accessions of brinjal (table 1) obtained from NBPGR Regional Station, Rajendranagar, Hyderabad-30. The experiment was carried out during the year 2010-11 at Horticultural Research Station, Venkataramannagudem. The seeds of all the accessions were sown in lines on raised nursery beds. Forty days old seedlings were transplanted in the main field in an Augmented Block Design. Each accession was grown in a single row plot of 10.5 m consisting of 14 plants spaced at 75 × 75 cm. Observations was recorded on five randomly selected plants from each line for twenty three characters *viz.* plant height (cm), plant spread (cm), number of branches per plant, leaf blade length (cm), leaf blade width (cm), leaf petiole length (cm), number of flowers per cluster, relative style length, fruit set percentage, days to harvest, number of fruits per cluster, number of fruits per plant, fruit length (cm), fruit diameter (cm), fruit pedicel length (cm), fruit pedicel thickness (cm), relative fruit calyx length (cm), fruit volume (cc), weight of fruit (g), seed diameter (cm), seed weight (g), fruit yield per plant (g) and yield (t ha⁻¹). Analysis of variance was carried out according to Cochran and Cox (1950). Analysis of covariance for all combinations of characters

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Table 1 : Particulars of brinjal germplasm studied.

S. no.	Accession no.	S. no.	Accession no.	S. no.	Accession no.
1.	EC-386589	29.	EC-384565	57.	IC-104083
2.	IC-249358	30.	IC-332508	58.	IC-280957
3.	IC-089949-B	31.	IC-304072	59.	IC-374867
4.	IC-112738	32.	IC-099676	60.	IC-545919
5.	IC-354528	33.	IC-336793	61.	IC-427017
6.	IC-112750	34.	IC-112726	62.	IC-305048
7.	IC-090915	35.	IC-112322	63.	IC-354564
8.	IC-298633	36.	IC-374912	64.	IC-089912
9.	IC-112909	37.	EC-385380	65.	DTB/098
10.	IC-374892	38.	IC-354612	66.	IC-112350
11.	IC-312984	39.	IC-398820	67.	IC-354597
12.	IC-397299	40.	IC-344646	68.	IC-354563
13.	IC-112997	41.	IC-354517	69.	IC-261772
14.	IC-112741	42.	IC-281112	70.	IC-305131
15.	IC-345740	43.	IC-112818	71.	IC-467274
16.	IC-354651	44.	IC-090785	72.	IC-413648
17.	IC-467271	45.	EC-329327	73.	IC-421194
18.	IC-090905	46.	IC-545948	74.	IC-090938
19.	IC-336472	47.	IC-218975	75.	IC-281104
20.	IC-112993	48.	IC-345747	76.	IC-090942
21.	IC-089989	49.	IC-261899	77.	IC-112747
22.	IC-316280	50.	IC-090987	78.	IC-089890
23.	IC-545937	51.	IC-281112	79.	IC-427008
24.	IC-279555	52.	IC-427007	80.	EC-316226
25.	IC-281092	53.	IC-272927	81.	Bhagyamati
26.	IC-545844	54.	IC-111387	82.	Shyamala
27.	IC-397557	55.	IC-354135	83.	Gulabi
28.	IC-350885	56.	IC-074239	84.	ArkaKeshav

Source : NBPGR Regional Station, Rajendranagar, Hyderabad.

were done and used for estimation of correlations. Phenotypic and genotypic correlations were worked out by the formulae suggested by Falconer (1964) and path coefficient of various characters was calculated as per Dewey and Lu (1959).

Results and Discussion

The correlation between fruit yield per plant with different yield attributes and among the attributes themselves are presented in tables 2 and 3. Out of twenty one characters, number of flowers per cluster, relative style length, fruit set percentage, number of fruits per cluster, number of fruits per plant, fruit length and seed weight exhibited a positive significant correlation at both phenotypic and genotypic levels with fruit yield per plant indicating that the association between yield and these characters was positive and high. This indicates that fruit yield in brinjal can be improved by direct selection of

fruit characters like number of fruits per cluster, fruit length and numbers of fruits per plant. The positive correlation between the desirable characters is favourable to the plant breeder because it helps in simultaneous improvement of all the characters. Fruit yield per plant was negatively correlated with number of days taken to harvest the fruit, indicating that the association between these two traits was negative and high. These results are in consonance with those reported by Singh *et al.* (2005), Pathania *et al.* (2005) and Surbhi Bansal and Mehta (2008).

The association between the characters showed the phenomenon of correlated response. The genetic factors responsible for correlated response are linkage and pleiotropy. Magnitude of correlation due to pleiotropy depends upon the direction of their effects. In the present study, correlation observed between any two characters, which were also correlated with yield and these lead to

Table 2 : Genotypic correlation co-efficients among yield and its components in brinjal.

No character	Plant height (cm)	Plant spread (cm)	Bran-ches / plant	Leaf blade length (cm)	Leaf blade width (cm)	Leaf petiole length (cm)	Flowers /cluster	Relative style length (cm)	Fruit Set (%)	Days to harvest	Fruits /cluster	Fruits /plant	Fruit length (cm)	Fruit breadth (cm)	Fruit pedicel length (cm)	Fruit pedicel thickness (cm)	Rel. fruit calyx length (cm)	Fruit volume (cm ³)	Weight of fruit (g)	Seed Diam-eter (cm)	100 seeds wt. (mg)
Plant height (cm)		0.4573	5.1817	1.6593	1.5268	1.4471	0.2558	0.2939	0.1584	0.2834	0.2637	-0.0201	0.0157	0.3016	-0.3159	0.8756	-1.6493	0.6619	0.9395	1.0667	0.5011
Plant spread (cm)			7.9647	0.7583	0.0980	0.5947	0.1711	0.1657	0.0989	-0.0338	0.1077	0.0390	-0.6754	0.6588	-1.1227	-0.1594	-2.8334	0.5088	0.5956	0.3340	0.3067
Branches/ plant				-0.3529	0.4266	-0.0538	-0.8228	-0.1618	-1.0566	-0.3706	-0.9680	-0.7184	-0.3048	0.9518	0.8655	1.1764	1.3418	1.2855	1.0378	-0.9897	-0.2896
Leaf blade length (cm)					0.8363	0.5846	-0.1367	-0.2042	-0.1113	-0.0329	-0.0707	-0.1129	-0.2129	0.2901	0.0209	0.1739	-0.3096	0.2757	0.3176	0.3313	0.0788
Leaf blade width (cm)						0.5474	-0.0802	-0.1569	-0.1437	0.0517	-0.1172	-0.1551	-0.2521	0.3081	-0.2495	0.2198	0.0136	0.2071	0.2574	0.3930	0.0948
Leaf petiole length (cm)							0.1877	0.0675	-0.0814	0.2559	0.0478	-0.1038	-0.0797	0.0576	0.0107	0.0532	-0.0808	0.1306	0.1819	0.2652	-0.0652
Flowers/ cluster								0.3703	0.4404	-0.0135	0.7044	0.4236	0.2087	-0.3853	-0.0798	-0.3226	0.4400	-0.3031	-0.3206	-0.0491	-0.0872
Relative style length (cm)									0.4070	0.1045	0.4924	0.4368	0.3640	-0.2403	0.2763	0.0531	-0.2109	-0.0047	-0.2397	-0.0039	0.0865
Fruit set (%)										-0.2053	0.9244	0.9534	0.4894	-0.3871	0.1691	-0.2170	0.5404	-0.1105	-0.3772	-0.1133	0.0968
Days to harvest											-0.1529	-0.1914	-0.0542	-0.1710	0.1156	-0.0432	-0.2174	-0.2980	0.0770	0.1349	0.0149
Fruits/ cluster												0.9002	0.4478	-0.3436	0.0718	-0.1957	0.6460	-0.1811	-0.3842	-0.1145	0.0007
Fruits/plant													0.5152	-0.3572	0.1583	-0.2001	0.5762	-0.1116	-0.3768	-0.1216	0.0976
Fruit length (cm)														-0.3703	0.5113	-0.2477	-1.1069	0.2299	-0.1210	-0.0744	0.0238
Fruit diameter (cm)															0.0729	0.2823	-0.2292	0.4558	0.5625	0.0474	0.2155
Fruit pedicel length (cm)																0.0247	-1.1087	0.0950	0.0059	0.0932	0.1112
Fruit pedicel thickness (cm)																	-0.4719	0.2719	0.2672	-0.0321	-0.0618
Rel. fruit calyx length (cm)																		-0.1132	-0.4481	-0.0064	0.3086
Fruit volume																			0.3121	0.0151	0.1930
Weight of fruit (g)																				0.1039	0.1837
Seed diameter (cm)																					0.2408
Yield per plant (g)	0.4758	0.4593	-0.4791	-0.0251	-0.1096	-0.0216	0.3074	0.3456	0.9021	-0.2268	0.7388	0.8323	0.5270	-0.1005	0.1723	-0.1348	0.2331	0.0415	-0.0461	-0.0694	0.2139

Table 3 : Phenotypic correlation co-efficients among yield and its components in brinjal.

No character	Plant height (cm)	Plant spread (cm)	Branches/ plant	Leaf blade length (cm)	Leaf blade width (cm)	Leaf petiole length (cm)	Flowers/ cluster	Relative style length (cm)	Fruit set (%)	Days to harvest	Fruits/ cluster
Plant height (cm)		0.1972*	0.2316*	0.3757***	0.3358***	0.3524***	0.0286	0.0788	0.0157	0.0731	0.0477
Plant spread (cm)			0.2552**	0.1306	0.1080	0.1233	0.0399	0.0462	0.0339	-0.0181	0.0355
Branches/ plant				0.0162	0.0708	0.0568	0.0981	0.0216	0.0896	0.0473	0.1220
Leaf blade length (cm)					0.7701***	0.5331***	-0.1363	-0.1911*	-0.0927	-0.0287	-0.0722
Leaf blade width (cm)						0.4999***	-0.0764	-0.1439	-0.1607	0.0440	-0.0931
Leaf petiole length (cm)							0.1629	0.0635	-0.0918	0.2407*	0.0155
Flowers/ cluster								0.3681***	0.4254***	-0.0142	0.7023***
Relative style length (cm)									0.3936***	0.1045	0.4828***
Fruit set (%)										-0.1981*	0.8756***
Days to harvest											-0.1510
Fruits/ cluster											
Fruits/plant											
Fruit length (cm)											
Fruit diameter (cm)											
Fruit pedicel length (cm)											
Fruit pedicel thickness (cm)											
Rel. fruit calyx length (cm)											
Fruit volume											
Weight of fruit (g)											
Seed diameter (cm)											
100 seeds wt. (mg)											
Yield per plant (g)	0.1234	0.1212	0.0496	-0.0195	-0.1124	-0.0176	0.3046**	0.3445***	0.8672***	-0.2258	0.7209***

Table 3 continued.....

No character	Fruits/ plant	Fruit length (cm)	Fruit breadth (cm)	Fruit pedicel length (cm)	Fruit pedicel thickness (cm)	Rel. fruit calyx length (cm)	Fruit volume (cm ³)	Weight of fruit (g)	Seed diameter (cm)	100 seeds wt. (mg)
Plant height (cm)	-0.0264	0.0584	0.1298	0.0621	0.1384	0.0190	0.1727	0.2726**	0.2861**	0.1344
Plant spread (cm)	0.0167	-0.1148	0.2744**	0.0209	-0.0004	-0.0477	0.1337	0.1579	0.0931	0.0854
Branches/ plant	0.0548	-0.0108	-0.0935	0.2345*	-0.1234	0.0646	-0.1886*	-0.1220	0.1320	0.0386
Leaf blade length (cm)	-0.0967	-0.0961	0.2468**	0.0365	0.1053	0.0449	0.2509**	0.2762**	0.3100***	0.0737
Leaf blade width (cm)	-0.1667	-0.2097	0.2506**	-0.1118	0.1614	-0.0036	0.1856	0.2317*	0.3604***	0.0870
Leaf petiole length (cm)	-0.1103	-0.0261	0.0353	0.0106	0.0369	0.1016	0.1185	0.1878*	0.2497**	-0.0614
Flowers/ cluster	0.4132***	0.1522	-0.3646***	-0.0686	-0.2810**	-0.1132	-0.2991**	-0.3177***	-0.0488	-0.0866
Relative style length (cm)	0.4269***	0.2882**	-0.2310*	0.2258*	0.0477	0.0643	-0.0047	-0.2349*	-0.0040	0.0865
Fruit set (%)	0.9550***	0.4184***	-0.3371***	0.1053	-0.1541	-0.1813	-0.1065	-0.4008***	-0.1095	0.0936
Days to harvest	-0.1867*	-0.0429	-0.1655	0.0901	-0.0414	0.0792	-0.2977**	0.0753	0.1349	0.0149
Fruits/ cluster	0.8619***	0.3129***	-0.3289***	0.0712	-0.1694	-0.1573	-0.1760	-0.3760***	-0.1123	0.0007
Fruits/plant		0.4350***	-0.3168***	0.1029	-0.1472	-0.1900*	-0.1088	-0.3969***	-0.1189	0.0954
Fruit length (cm)			-0.2665**	0.3416***	-0.0872	0.0913	0.1803	-0.1114	-0.0589	0.0189
Fruit diameter (cm)				0.0595	0.2845**	0.1177	0.4413***	0.5108***	0.0456	0.2072*
Fruit pedicel length (cm)					0.0806	0.3305***	0.0622	0.0163	0.0762	0.0909
Fruit pedicel thickness (cm)						0.2735**	0.2451**	0.2146*	-0.0289	-0.0556
Rel. fruit calyx length (cm)							0.0362	0.1304	0.0019	-0.0941
Fruit volume								0.3060**	0.0151	0.1927*
Weight of fruit (g)									0.1018	0.1801
Seed diameter (cm)										0.2408*
100 seeds wt. (mg)										
Yield per plant (g)	0.8089***	0.4412***	-0.0972	0.1420	-0.1147	-0.0805	0.0410	-0.0391	-0.0692	0.2132*

Table 4 : Genotypic path co-efficients among yield and its components in brinjal.

Character	Plant height	Plant spread	Bran-ches/plant	Leaf blade length	Leaf blade width	Leaf petiole length	Flow-ers/cluster	Relative style length	Fruit set	Days to harvest	Fruits/cluster	Fruits/plant	Fruit length	Fruit diameter	Fruit pedicel length	Rel. fruit calyx length	Fruit volume	Weight of fruit	Seed Diam-eter	100 seeds (wt.)
Plant height (cm)	-0.1291	-0.0590	-0.6688	-0.2142	-0.1971	-0.1868	-0.0330	-0.0379	-0.0204	-0.0366	-0.0340	0.0026	-0.0020	-0.0389	0.0408	-0.1130	-0.0854	-0.1213	-0.1377	-0.0647
Plant spread (cm)	0.0448	0.0980	0.7808	0.0743	0.0096	0.0583	0.0168	0.0162	0.0097	-0.0033	0.0106	0.0038	-0.0662	0.0646	-0.1101	-0.2778	0.0499	0.0584	0.0327	0.0301
Branches/plant	-0.6617	-1.0171	-0.1277	0.0451	-0.0545	0.0069	0.1051	0.0207	0.1349	0.0473	0.1236	0.0917	0.0389	-0.1215	-0.1105	-0.1713	-0.1642	-0.1325	0.1264	0.0370
Leaf blade length (cm)	-0.6071	-0.2775	0.1291	-0.3659	-0.3060	-0.2139	0.0500	0.0747	0.0407	0.0120	0.0259	0.0413	0.0779	-0.1061	-0.0076	0.1133	-0.1009	-0.1162	-0.1212	-0.0288
Leaf blade width (cm)	0.3617	0.0232	0.1011	0.1981	0.2369	0.1297	-0.0190	-0.0372	-0.0340	0.0122	-0.0278	-0.0368	-0.0597	0.0730	-0.0591	0.0032	0.0491	0.0610	0.0931	0.0225
Leaf petiole length (cm)	0.3511	0.1443	-0.0131	0.1418	0.1328	0.2426	0.0455	0.0164	-0.0197	0.0621	0.0116	-0.0252	-0.0193	0.0140	0.0026	-0.0196	0.0317	0.0441	0.0643	-0.0158
Flowers/ cluster	0.2349	0.1571	-0.7556	-0.1256	-0.0736	0.1724	0.9184	0.3401	0.4045	-0.0124	0.6469	0.3890	0.1917	-0.3538	-0.0733	0.4041	-0.2784	-0.2944	-0.0451	-0.0800
Relative style length (cm)	-0.0091	-0.0052	0.0050	0.0064	0.0049	-0.0021	-0.0115	-0.0311	-0.0127	-0.0033	-0.0153	-0.0136	-0.0113	0.0075	-0.0086	0.0066	0.0001	0.0075	0.0001	-0.0027
Fruit set (%)	0.3752	0.2341	-2.5027	-0.2637	-0.3404	-0.1927	1.0432	0.9640	2.3685	-0.4864	2.1896	2.2582	1.1590	-0.9168	0.4005	-0.5140	-0.2617	-0.8933	-0.2683	0.2292
Days to harvest	0.0061	-0.0007	-0.0080	-0.0007	0.0011	0.0055	-0.0003	0.0023	-0.0044	0.0216	-0.0033	-0.0041	-0.0012	-0.0037	0.0025	-0.0009	-0.0064	0.0017	0.0029	0.0003
Fruits/ cluster	-0.6087	-0.2487	2.2342	0.1632	0.2706	-0.1104	-1.6258	-1.1365	-2.1337	0.3530	-2.3081	-2.0777	-1.0336	0.7931	-0.1658	-0.0047	0.4180	0.8867	0.2642	-0.0017
Fruits/plant	-0.0157	0.0305	-0.5618	-0.0883	-0.1213	-0.0812	0.3313	0.3416	0.7455	-0.1497	0.7039	0.7820	0.4029	-0.2794	0.1238	0.4506	-0.0873	-0.2946	-0.0951	0.0763
Fruit length (cm)	-0.0039	0.1692	0.0764	0.0533	0.0632	0.0200	-0.0523	-0.0912	-0.1226	0.0136	-0.1122	-0.1291	-0.2506	0.0928	-0.1281	0.2773	-0.0576	0.0303	0.0186	-0.0060
Fruit diameter (cm)	0.0835	0.1823	0.2634	0.0803	0.0853	0.0159	-0.1066	-0.0665	-0.1071	-0.0473	-0.0951	-0.0989	-0.1025	0.2767	0.0202	-0.0634	0.1261	0.1557	0.0131	0.0596
Fruit pedicel length (cm)	0.0186	0.0662	-0.0510	-0.0012	0.0147	-0.0006	0.0047	-0.0163	-0.0100	-0.0068	-0.0042	-0.0093	-0.0302	-0.0043	-0.0590	0.0654	-0.0056	-0.0003	-0.0055	-0.0066
Fruit pedicel thickness (cm)	0.2208	-0.0402	0.2967	0.0438	0.0554	0.0134	-0.0814	0.0134	-0.0547	-0.0109	-0.0493	-0.0505	-0.0625	0.0712	0.0062	0.2522	0.0686	0.0674	-0.0081	-0.0156
Rel. fruit calyx length (cm)	0.4190	0.7198	-0.3409	0.0787	-0.0035	0.0205	-0.1118	0.0536	-0.1373	0.0552	-0.1641	-0.1464	0.2812	0.0582	0.2817	0.1199	0.0288	0.1138	0.0016	-0.0784
Fruit volume	0.1483	0.1140	0.2881	0.0618	0.0464	0.0293	-0.0679	-0.0010	-0.0248	-0.0668	-0.0406	-0.0250	0.0515	0.1021	0.0213	0.0609	0.2241	0.0699	0.0034	0.0432
Weight of fruit (g)	0.3006	0.1906	0.3321	0.1016	0.0824	0.0582	-0.1026	-0.0767	-0.1207	0.0246	-0.1229	-0.1206	-0.0387	0.1800	0.0019	0.0855	0.0999	0.3200	0.0332	0.0588
Seed diameter (cm)	-0.0362	-0.0113	0.0335	-0.0112	-0.0133	-0.0090	0.0017	0.0001	0.0038	-0.0046	0.0039	0.0041	0.0025	-0.0016	-0.0032	0.0011	-0.0005	-0.0035	-0.0339	-0.0082
100 seeds wt. (mg)	-0.0174	-0.0106	0.0100	-0.0027	-0.0033	0.0023	0.0030	-0.0030	-0.0034	-0.0005	0.0000	-0.0034	-0.0008	-0.0075	-0.0039	0.0021	-0.0067	-0.0064	-0.0084	-0.0347
Yield per plant (g)	0.4758	0.4593	-0.4791	-0.0251	-0.1096	-0.0216	0.3074	0.3456	0.9021	-0.2268	0.7388	0.8323	0.5270	-0.1005	0.1723	-0.1348	0.0415	-0.0461	-0.0694	0.2139

Table 5 : Phenotypic Path co-efficients among yield and its components in brinjal.

Character	Plant height	Plant spread	Bran-ches/plant	Leaf blade length	Leaf blade width	Leaf petiole length	Flow-ers/cluster	Relative style length	Fruit set (%)	Days to harvest	Fruits/cluster	Fruits/plant	Fruit length	Fruit breadth	Fruit pedicel length	Fruit pedicel thickness	Rel. fruit calyx length	Fruit volume	Weight of fruit	Seed diameter	100 seeds wt.
Plant height (cm)	0.0079	0.0016	0.0018	0.0030	0.0027	0.0028	0.0002	0.0006	0.0001	0.0006	0.0004	-0.0002	0.0005	0.0010	0.0005	0.0011	0.0002	0.0014	0.0022	0.0023	0.0011
Plant spread (cm)	0.0023	0.0117	0.0030	0.0015	0.0013	0.0014	0.0005	0.0005	0.0004	-0.0002	0.0004	0.0002	-0.0013	0.0032	0.0002	0.0000	-0.0006	0.0016	0.0018	0.0011	0.0010
Branches/plant	-0.0007	-0.0008	-0.0032	-0.0001	-0.0002	-0.0002	-0.0003	-0.0001	-0.0003	-0.0002	-0.0004	-0.0002	0.0000	0.0003	-0.0008	0.0004	-0.0002	0.0006	0.0004	-0.0004	-0.0001
Leaf blade length (cm)	-0.0112	-0.0039	-0.0005	-0.0298	-0.0229	-0.0159	0.0041	0.0057	0.0028	0.0009	0.0022	0.0029	0.0029	-0.0074	-0.0011	-0.0031	-0.0013	-0.0075	-0.0082	-0.0092	-0.0022
Leaf blade width (cm)	-0.0063	-0.0020	-0.0013	-0.0145	-0.0189	-0.0094	0.0014	0.0027	0.0030	-0.0008	0.0018	0.0031	0.0040	-0.0047	0.0021	-0.0030	0.0001	-0.0035	-0.0044	-0.0068	-0.0016
Leaf petiole length (cm)	0.0193	0.0067	0.0031	0.0292	0.0274	0.0548	0.0089	0.0035	-0.0050	0.0132	0.0008	-0.0060	-0.0014	0.0019	0.0006	0.0020	0.0056	0.0065	0.0103	0.0137	-0.0034
Flowers/cluster	0.0012	0.0017	0.0043	-0.0059	-0.0033	0.0071	0.0435	0.0160	0.0185	-0.0006	0.0306	0.0180	0.0066	-0.0159	-0.0030	-0.0122	-0.0049	-0.0130	-0.0138	-0.0021	-0.0038
Relative style length (cm)	0.0059	0.0034	0.0016	-0.0143	-0.0107	0.0047	0.0275	0.0746	0.0294	0.0078	0.0360	0.0319	0.0215	-0.0172	0.0168	0.0036	0.0048	-0.0003	-0.0175	-0.0003	0.0065
Fruit set (%)	0.0200	0.0433	0.1144	-0.1184	-0.2052	-0.1172	0.5433	0.5027	1.2772	-0.2531	1.1183	1.2197	0.5344	-0.4305	0.1345	-0.1969	-0.2316	-0.1361	-0.5118	-0.1399	0.1195
Days to harvest	-0.0056	0.0014	-0.0036	0.0022	-0.0034	-0.0185	0.0011	-0.0080	0.0152	-0.0769	0.0116	0.0144	0.0033	0.0127	-0.0069	0.0032	-0.0061	0.0229	-0.0058	-0.0104	-0.0011
Fruits/cluster	-0.0098	-0.0073	-0.0250	0.0148	0.0191	-0.0032	-0.1440	-0.0990	-0.1795	0.0310	-0.2050	-0.1766	-0.0641	0.0674	-0.0146	0.0347	0.0322	0.0361	0.0771	0.0230	-0.0001
Fruits/plant	0.0046	-0.0029	-0.0095	0.0168	0.0290	0.0192	-0.0720	-0.0743	-0.1663	0.0325	-0.1501	-0.1741	-0.0757	0.0552	-0.0179	0.0256	0.0331	0.0189	0.0691	0.0207	-0.0166
Fruit length (cm)	0.0048	-0.0094	-0.0009	-0.0079	-0.0172	-0.0021	0.0125	0.0237	0.0344	-0.0035	0.0257	0.0357	0.0822	-0.0219	0.0281	-0.0072	0.0075	0.0148	-0.0092	-0.0048	0.0015
Fruit diameter (cm)	0.0153	0.0323	-0.0110	0.0290	0.0295	0.0041	-0.0429	-0.0272	-0.0397	-0.0195	-0.0387	-0.0373	-0.0313	0.1176	0.0070	0.0335	0.0138	0.0519	0.0601	0.0054	0.0244
Fruit pedicel length (cm)	-0.0014	-0.0005	-0.0053	-0.0008	0.0025	-0.0002	0.0016	-0.0051	-0.0024	-0.0020	-0.0016	-0.0023	-0.0078	-0.0014	-0.0227	-0.0018	-0.0075	-0.0014	-0.0004	-0.0017	-0.0021
Fruit pedicel thickness (cm)	-0.0091	0.0000	0.0082	-0.0070	-0.0107	-0.0024	0.0186	-0.0032	0.0102	0.0027	0.0112	0.0097	0.0058	-0.0188	-0.0053	-0.0660	-0.0181	-0.0162	-0.0142	0.0019	0.0037
Rel. fruit calyx length (cm)	0.0011	-0.0027	0.0036	0.0025	-0.0002	0.0057	-0.0063	0.0036	-0.0101	0.0044	-0.0088	-0.0106	0.0051	0.0066	0.0185	0.0153	0.0560	0.0020	0.0073	0.0001	-0.0053
Fruit volume	-0.0078	-0.0061	0.0085	-0.0114	-0.0084	-0.0054	0.0135	0.0002	0.0048	0.0135	0.0080	0.0049	-0.0082	-0.0200	-0.0028	-0.0111	-0.0016	-0.0453	-0.0138	-0.0007	-0.0087
Weight of fruit (g)	0.0884	0.0512	-0.0396	0.0896	0.0752	0.0609	-0.1031	-0.0762	-0.1300	0.0244	-0.1220	-0.1288	-0.0362	0.1657	0.0053	0.0696	0.0423	0.9993	0.3245	0.0330	0.0584
Seed diameter (cm)	-0.0012	-0.0004	-0.0006	-0.0014	-0.0016	-0.0011	0.0002	0.0000	0.0005	-0.0006	0.0005	0.0005	0.0003	-0.0002	-0.0003	0.0001	0.0000	-0.0001	-0.0004	-0.0044	-0.0010
100 seeds wt. (mg)	0.0058	0.0037	0.0017	0.0032	0.0038	-0.0027	-0.0038	0.0037	0.0041	0.0006	0.0000	0.0041	0.0008	0.0090	0.0039	-0.0024	-0.0041	0.0083	0.0078	0.0104	0.0433
Yield per plant (g)	0.1234	0.1212	0.0496	-0.0195	-0.1124	-0.0176	0.3046	0.3445	0.8672	-0.2258	0.7209	0.8089	0.4412	-0.0972	0.1420	-0.1147	-0.0805	0.0410	-0.0391	-0.0692	0.2132

Note : Figures in bold indicate direct effects.

R Square = 0.8989, Residual effect = 0.3179

influence that association among different characters was mostly due to pleiotropy. The present investigation shows that number of fruits per plant and fruit length are positively correlated with each other and also correlated with fruit yield. This may be due to pleiotropy.

But for some correlations, one character was correlated with yield and other was not correlated with yield. This led to the association among the different characters mostly due to linkage and not due to pleiotropy. These were supported by the fact that the genetic variability parameters for some of the characters correlated with yield were not of same magnitude as that of yield (Mallikarjun *et al.*, 2003). Fruit volume is not significantly correlated with yield, but this trait recorded positive and significant association with fruit diameter, weight of the fruit and seed weight. Association of these characters may be due to linkage. If genes controlling different traits are tightly linked, selection of one trait may automatically favour the other linked traits and correlated response is inevitable. However, unfavourable negative correlations can be broken by repeated hybridization between random individuals or more preferably selected ones. Biparental mating in selected F₂ segregants tends to achieve this goal with remarkable rapidity.

From the present investigation, it is inferred that characters *viz.*, number of flowers per cluster, number of fruits per cluster, average fruit length and number of fruits per plant are highly correlated with fruit yield per plant and among themselves and are identified as major yield components. These findings indicate that the genetic improvement of fruit yield per plant can be obtained by direct selection for these yield components.

The correlation coefficient between yield and a particular yield component was the net result of direct effect of that attribute and indirect effect through other yield contributing traits. The total correlation between yield and a component trait may sometimes be misleading as it might be an over-estimate or under-estimate. Hence, direct selection based on character association may not be fruitful. Therefore, it is necessary to partition the total correlation coefficients into direct and indirect effect of cause as devised by Wright (1921).

Based on the above, the characters subjected to correlations were also subjected to path coefficient analysis for estimating the direct and indirect effects (tables 4 and 5), so as to formulate more authentic for selection in brinjal.

The fruit set percentage, number of flowers per cluster, number of fruits per plant and weight of fruit

exerted a high positive direct effect on fruit yield per plant. The high direct effect of these traits appeared to be the main factor for their strong association with fruit yield per plant. Hence direct selection for these traits would be highly effective in improving the fruit yield per plant. Mohanty (1999), Mishra *et al.* (2007) and Lohakare *et al.* (2008) also have reported similar results in brinjal.

The results of the study indicated that the characters with positive correlation have shown high direct effects. Thus, fruit set percentage, weight of fruit, number of fruits per plant, relative style length, number of flowers per cluster and number of fruits per cluster had high direct and correlation values.

The residual effect of 0.3179 indicated that some other possible characters, which have not been studied in the present investigation, need to be included in the analysis to account fully for the variation in fruit yield of brinjal.

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