

Table 2. Phenotypic correlations among growth and yield traits in brinjal genotypes. **Significant at 1% level of significance. *Significant at 5% level of significance. X_1 : Plant height at 90 DAT (cm), X_2 : Days to first flowering, X_3 : Days to 50% flowering, X_4 : Number of branches at 60 DAT, X_5 : Number of flowers per cluster, X_6 : Fruit set (%), X_7 : Yield per plant (kg), X_8 : Fruit weight (g), X_9 : Number of cluster per plant, X_{10} : Number of fruits per cluster, X_{11} : Fruit length (cm), X_{12} : Yield per ha (ton).

Characters	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}
X_1	1.00	-0.099	-0.097	0.472**	-0.011	0.298*	0.131	0.040	0.182	0.157	0.185	0.014
X_2		1.00	0.799**	0.068	0.063	0.062	0.152	0.025	0.001	0.049	0.032	0.333**
X_3			1.00	-0.157	0.064	-0.161	-0.093	0.091	-0.023	-0.093	-0.086	-0.070
X_4				1.00	-0.436	0.307**	0.022	-0.171	-0.07	0.061	0.137	0.022
X_5					1.00	-0.810	0.323**	0.100	0.098	0.414**	0.192	0.293*
X_6						1.00	0.486**	-0.358	-0.212	0.855**	0.754**	0.372**
X_7							1.00	0.667**	0.290*	0.562**	0.514**	0.602**
X_8								1.00	0.027	-0.277	-0.225	-0.016
X_9									1.00	0.293*	0.289*	0.158
X_{10}										1.00	0.729**	0.330**
X_{11}											1.00	0.359**
X_{12}												1.00

expression of which depends upon the other characters like, number of branches and fruits per cluster that are related to fruit yield. Hence yield is considered as dependent character (effect) while the other character influencing yield are called as independent characters (causes). Hence the present investigation was made to study the association between the characters and direct and indirect effects of yield components on fruit yield per hectare in brinjal.

Methods

The experiment material consisted of 40 diversi-

fied genotypes of brinjal. The genotypes were obtained from IIHR, VRS Kalyanpur and local collection were grown in a randomized block design with two replication at the vegetable research block of the Department of Horticulture, UAS, GKVK, Bangalore. For recording observations, five plants were selected randomly from each plot in each replication and the observation recorded for the characters like, plant height (cm), number of branches per plant, number of cluster per plant, fruit set (%), days to first flowering, days to 50% flowering, number of flower per cluster,

Table 3. Path coefficient analysis of the component characters on fruit yield per hectare Residual value = 0.3381. Figures in **bold red** are direct effects. **Significant at 1% level of significance *Significant at 5% level of significance. X_1 : Plant height at 90 DAT (cm), X_2 : Days to first flowering, X_3 : Days to 50% flowering, X_4 : Number of branches at 60 DAT, X_5 : Number of flowers per cluster, X_6 : Fruit set (%), X_7 : Yield per plant (kg), X_8 : Fruit weight (g), X_9 : Number of cluster per plant, X_{10} : Number of fruits per cluster, X_{11} : Fruit length (cm), r_g : Genotypic correlation value.

Characters	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	r_g
X_1	-0.2156	-0.0105	0.0073	0.1377	-0.0001	-0.1140	0.1584	-0.0109	0.0822	-0.0552	0.0359	0.014
X_2	0.0231	0.0980	-0.0580	0.0215	-0.0057	-0.0242	-0.1831	0.0068	-0.0029	-0.0155	0.0062	0.331**
X_3	0.0219	0.0794	-0.0717	-0.0532	0.0071	0.0840	-0.1336	-0.0256	0.0060	0.0327	-0.0170	-0.072
X_4	-0.0976	0.0069	0.0125	0.3043	-0.0426	-0.1704	-0.0063	0.0500	-0.0296	-0.0331	0.0274	0.022
X_5	0.0022	-0.0058	-0.0053	-0.1344	0.0964	0.0322	0.2573	-0.0282	0.0458	-0.1463	0.0383	0.354**
X_6	-0.0538	0.0052	0.0132	0.1135	-0.0068	-0.4571	0.5833	0.1038	0.1291	-0.2977	0.1545	0.297*
X_7	-0.0335	-0.0176	0.0094	-0.0019	0.0243	-0.2616	0.9864	-0.0214	0.0779	-0.2242	0.1141	0.685**
X_8	-0.0086	-0.0025	-0.0067	-0.0556	0.0099	0.1736	0.0799	-0.2733	0.0132	0.0977	-0.0437	-0.016
X_9	-0.0662	-0.0011	-0.0016	-0.0337	0.0165	-0.2205	0.2966	-0.0135	0.2677	-0.1719	0.0860	0.458**
X_{10}	-0.0346	0.0044	0.0068	0.0293	0.0410	-0.3959	0.6648	0.0777	0.1338	-0.3438	0.1586	0.342**
X_{11}	-0.0400	0.0031	0.0063	0.0431	0.0191	-0.3651	0.6016	0.0618	0.1190	-0.2819	0.1934	0.360**

number of fruits per cluster, length (cm), fruit weight (g), fruit yield per plant (kg) and fruit yield per hectare. Correlation and path coefficient analysis were worked out according to the methods described by Weber and Murthy (1) and Dewey and Lu (2) respectively.

Results and Discussion

Correlation studies on fruit yield per hectare and its component traits revealed that the values of genotypic correlation coefficient (Table 1) were higher than the phenotypic correlation coefficient (Table 2), which may be ascribed to the low effect of environment on the character association. In the present investigation association of fruit yield was positive and significant with days to first flowering, number of flowers per cluster, fruit set %, fruit yield per plant (kg), number of fruits per cluster and fruit length (cm) at genotypic and phenotypic level. These results are in conformity with the results obtained by Sarnaik and Patel (3) in brinjal.

The characters such as days to 50% flowering and fruit weight (g) showed negative correlation with yield. Plant height at 90 days after transplanting (DAT) and number of branches at 60 DAT showed positive and nonsignificant association with fruit yield per hectare. Similar results were also reported by Thamburaj (4) and Swaroop and Sharma (5).

The correlation among the yield components such as plant height showed positive and significant correlation with number of branches at 60 DAT and number of clusters per plant. Days to first flowering revealed positive and significant correlation with days to 50% flowering and yield per hectare. Number of flowers per cluster exhibited significant and positive correlation with fruit yield per plant (kg) and number of fruits per cluster. Fruit set (%) exhibited positive significant correlation with the fruit yield per plant (kg), number of cluster per plant, number of fruits per cluster and fruit length (cm). Fruit yield per plant (kg) revealed positive and significant correlation with number of fruits per cluster and fruit length (cm). Number of cluster per plant and number of fruits per cluster

exhibited significant positive correlation with fruit length (cm) at genotypic level.

These character association studies suggest that number of fruits per plant may be the most important yield attributing character in brinjal. Hence, fruit yield in brinjal could be improved by giving more importance to this trait than the other characters such as number of primary branches per plant, plant height (cm), fruit weight (g) and days to 50% flowering.

Path coefficient analysis (Table 3) revealed that positive direct effect on fruit yield per hectare was exhibited by days to first flowering, number of branches at 60 DAT, number of flowers per cluster, fruit yield per plant (kg), number of cluster per plant and fruit length (cm). Fruit yield per plant (kg) exerted maximum positive direct effect on fruit yield per hectare (ton). Its indirect effects through other traits were positive and moderate. Similar observations were made by Sarnaik and Patel (3) in brinjal.

In the present investigation, path analysis clearly indicated that fruit yield per plant exhibited high direct effect on fruit yield per hectare and also contributed indirectly through other characters. Number of cluster per plant was the next trait contributed substantially to the fruit yield per hectare directly. Therefore, fruit yield per plant along with number of clusters per plant may be given more importance while formulating selection criteria to improve fruit yield per hectare in brinjal.

References

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