Madras Agric. J., 82(6,7,8): 488-490 June, July, August 1995
https://doi.org/10.29321/MAJ.10.A01243

INTER -RELATIONSHIP OF QUANTITATIVE TRAITS IN BRINJAL

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ABSTRACT

Twenty one varieties of brinjal (*Solanum melongena* L) were studied in *kharif* season for correlation analysis. The yield per plant showed significant positive association with flowers per cluster, fruit length, fruit value, primary branches per plant and fruits per plant but non-significant correlation with fruit diameter. The correlation coefficient *inter-se* were also important. Most of the environmental correlation coefficient were not significant. It can be concluded that four characters *i.e.* fruit length, primary branches per plant, number of fruits per plant and early yield could form a sound basis for selection.

KEY WORDS : Brinjal, Quantitative Traits, Inter-relationship

Brinjal is one of the important vegetables and is grown in nearly all kitchen gardens. There is a pressing demand for high yielding varieties of brinjal. Therefore, to bring about any improvement in this crop, the knowledge of association of yield with other characters is of immense help in selecting suitable type. However, yield itself is the result of the interaction of a number of factors inherent both in the plant as well as in the environment in which the plant grows. It is, therefore, difficult to evaluate or select for this complex character directly. Hence, the objective of the present investigation was to screen the available varieties for yield and to work out its relationship with other important traits in brinjal which can prove highly useful in an objective selection of characters.

MATERIALS AND METHODS

Twenty one varieties of brinjal were selected for this study. These were transplanted on 2 April 1986 in three row plots containing 5 plant in each row at a distance of 60 cm from row to row and plant to plant. The detailed observation on 5 plants per plot were recorded for days to flowering, days to first fruit set, flowers per cluster, fruit length, fruit diameter, fruit value, plant height, primary branches per plant, fruits per plant, fruit weight, early yield per plant and yield per plant. The correlation analysis was worked out according to the method suggested by Weight (1935).

RESULTS AND DISCUSSION

The estimates of phenotypic, genotypic and environmental correlations coefficient between yield per plant and its components are presented inn Table 1. The values of genotypic correlation were greater than of phenotypic correlation. It indicates the strong inherent association between the various characters pairs studied. Johnson *et al.* (1995) also observed higher genotypic correlation then phenotypic correlation coefficient between various pairs of character in soybean.

The yield per plant showed significant positive association with flower per cluster, fruit length, fruit value, primary branches per plant and fruits per plant. Such correlation revealed the possibility that in this crop, selection for strains with more number of flower per cluster, longer fruits, large number of primary branches and fruits per plant can be expected to result higher yielding strains. The positive and significant association of number of fruits per plant with yield suggested that the number of fruits was the principal yield attribute and indicated the importance of yield components in influencing fruit yield (Singh and Singh, 1979). Therefore, it could be given the due consideration while making selection in the segregating populations. Yield was also significantly and negatively correlated with days to flower, days to first fruit set, fruit diameter, plant height and fruit weight. These results are in agreement with the findings of Singh (1983). The correlation coefficients *inter se* were also important. The genotypic correlation coefficient revealed that the association of days to flowering with days to first fruit set, plant height and fruit weight was positive. This shows that selection for lateness will give more yield which is otherwise an undersirable trait. However, there was a negative significant genotypic association of this character with the

Table 1. Genotypic (G), phenotypic (P) and environmental (E) correlation coefficients between different pairs of character in brinjal

Characters		Days to first fruit set	Flower per cluster	Fruit length	Fruit diameter	Fruit value	Plant height	Primary branches per plant	Fruits per plant	Fruit weight	Early yield/ plant	Yield / plant
Days to flowering	G	0.989**	-0.169	-0.536**	0.257	-0.363*	0.633**	-0.671**	-0.498**	0.450*	-0.905**	-0.734**
	P	0.889**	-0.154	0.154	0.237	-0.337	0.624**	-0.567**	-0.488*	0.436*	-0.879**	-0.709**
	E	0.991**	0.228	0.196	0.407*	0.205	0.494**	-0.010	-0.293	-0.033	-0.038	0.031
Days to first fruit set	G	-	0.218	-0.436*	0.213	-0.294	0.629	-0.609**	-0.524**	0.458*	-0.867**	-0.731**
	P	-	0.200	-0.388	0.195	-0.271	0.612**	-0.513**	-0.514**	0.444*	-0.843**	-0.703**
	E	-	-0.207	0.200	-0.386*	0.192	0.492**	-0.077	-0.329	-0.040	0.329	0.019
Flower per cluster	G	-	-	0.066	-0.518**	0.111	-0.402*	-0.308	0.700**	-0.557**	0.194	0.504**
	P	-	-	-0.074	-0.499**	0.092	-0.355	-0.283	0.650**	-0.528**	0.200	0.579**
	E	-	-	-0.198	-0.069	-0.574**	0.370*	-0.257	-0.192	0.189	0.281	0.225
Fruit length	G	-	-	-	-0.597**	0.904**	-0.519**	0.578**	0.429*	-0.483*	0.755**	0.672**
	P	-	-	-	-0.558**	0.896**	-0.436*	0.509**	0.381*	-0.439*	0.703**	0.611**
	G	-	-	-	-0.171	0.882**	0.295	0.285	-0.055	0.083	0.281	-0.030
Fruit diameter	G	-	-	-	-	-0.690**	-0.704**	-0.005	-0.526**	0.886**	-0.575**	-0.469*
	P	-	-	-	-	-0.681**	0.642**	0.011	-0.499**	0.855	-0.556**	-0.446*
	G	-	-	-	-	-0.548**	-0.490*	0.153	0.050	0.055	0.086	0.244
Fruit value	G	-	-	-	-	-	-0.550**	0.268	0.503**	-0.602**	0.671**	0.578**
	P	-	-	-	-	-	-0.487*	0.238	0.472*	-0.574**	0.641**	0.543**
	E	-	-	-	-	-	0.380*	0.140	0.015	0.002	0.018	-0.110
Plant height	G	-	-	-	-	-	-	0.061	-0.472*	0.746**	-0.813**	-0.686**
	P	-	-	-	-	-	-	-0.053	-0.446*	0.716**	-0.759**	-0.651**
	E	-	-	-	-	-	-	-0.028	-0.079	0.011	0.323	-0.037
Primary branches per plant	G	-	-	-	-	-	-	-	0.103	-0.068	0.526**	0.493**
	P	-	-	-	-	-	-	-	0.030	-0.472*	0.443*	0.380*
	E	-	-	-	-	-	-	-	-0.404	0.109	0.070	-0.295
Fruits per plant	G	-	-	-	-	-	-	-	-	-0.713**	0.561**	0.594**
	P	-	-	-	-	-	-	-	-	-0.696**	0.549**	0.571**
	E	-	-	-	-	-	-	-	-	-0.358	0.290	0.093
Fruit weight	G	-	-	-	-	-	-	-	-	-	-0.673**	-0.685**
	P	-	-	-	-	-	-	-	-	-	-0.664**	-0.671**
	E	-	-	-	-	-	-	-	-	-	-0.294	-0.233
Early yield per plant (kg)	G	-	-	-	-	-	-	-	-	-	-	0.833**
	P	-	-	-	-	-	-	-	-	-	-	0.822**
	E	-	-	-	-	-	-	-	-	-	-	0.486*

* P = 0.5, ** P = 0.01

fruit length, fruit value, primary branches per plant and fruits per plant. The positive association of days to first fruit set with fruit weight suggested that the selection of early fruit setting genotypes would help in isolating lines with larger fruit weight.

Flower per cluster had negative association with fruit diameter, plant height and fruit weight thus implying that larger number of flowers would result the diversion of food towards more number of fruits per cluster and consequently reduction in fruit diameter and weight. The character fruit length was positively correlated phonotypically and genotypically with fruit value, primary branches per plant and fruits per plant (Baha-Eldin *et al.*, (1969). The character was also negatively associated with fruit diameter, plant height and fruit weight. The positive significant association of fruit diameter and fruit weight indicated that selection of fruit with greater diameter genotypes would result in isolating strains with higher fruit weight.

The phenotypic and genotypic correlation coefficient revealed that the association of plant height with number of primary branches was low. The plant height showed negative genotypic correlation with number of fruits per plant. Similar were the findings of Srivastava and Sachan (1973). The present data also indicated that the number of

primary branches per plant had significant genotypic and phenotypic correlation coefficient with early and total yield per plant. It reveals that the number of primary branches had direct significant effect on the total fruit yield and also influence other yield contributing characters *viz.*, duration of flowering and fruit length.

Fruits per plant had positive significant correlation with flower per cluster and as consequence had positive significant association with early and total yield per plant which in turn leads to high yield. Fruits per plant had also shown negative and significant correlation with fruit weight. It shows with the increase in number of fruits per plant, there is simultaneous decrease in fruit weight due to the fact that maximum nutrients have been utilized for the formation of number of fruits in the plant and causing above association. This indicated that selection for one of these two characters would automatically decrease the other charactrs. The negative significant associations were obtained between fruit weight and yield per plant. This character, therefore, cannot form a sound basis for selection.

Most of the environmental correlation coefficients were non significant where as phenotypic and genotypic correlation coefficient were significant, further showed that the effect of environment on the expression of the association between the character was not so strong as to alter it markedly. However, the environmental correlations between the days to flower with days to fruit setting, fruit diameter and plant height, days to fruit set with plant height, flower per cluster with plant height and early yeild were positive and significant. It may be concluded that for selecting high yeilding genotypes, selection based on fruit length, primary branches per plant, number of fruits per plant and early yield would be quite rewarding.

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(Received: August 1988 Revised: February 1990)

Madras Agric. J., 82(6,7,8): 490-491 June, July, August 1995

RESEARCH NOTES

GENETIC VARIABILITY IN GREEN GRAM

Knowledge of nature and magnitude of genetic variability in the population is of immense use for planning efficient breeding programme to improve the yield potential of the genotype. Studies were undertaken to know the amount of variability in green gram using 89 genotypes, since the information on this aspect in green gram is limited. The material were grown in randomised block design with two replications during *kharif* 1982. Each genotype was represented by two rows of five m length with a spacing of 30 x 10 cm. Observations were recorded on five randomly selected competitive plants of each replication for eight characters as detailed in Table 1. Statistical analysis for various parameters was performed as suggested by Burton (1952). Hanson *et al.* (1956) and Johnson *et al.* (1955).

Significant differences among varieties for all the characters were observed (Table 1) showing large amount of variability for all the characters except for days to flowering and number of seeds per pod as indicated by the estimates of genetic coefficient of variability (GCV) and phenotypic coefficient of variability (PCV). In general, GCV and PCV were observed to be more or less similar