

Studies on combining ability in Round Brinjal (*Solanum melongena* L.)

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(Accepted : September 2005)

SUMMARY

Combining ability analysis of a 10 x 10 diallel, excluding reciprocals was undertaken for fruit yield per plant and its component characters in round brinjal. Non-additive gene action was noticed to be pre-ponderant for fruit yield per plant, days to first picking, plant height and primary branches per plant, while additive gene action was predominant for the fruit characters studied, namely, fruit length, fruit diameter, fruit weight and fruits per plant. A perusal of the *GCA* effects revealed AB 98-13, PLR 1 and JBPR 1 to be good general combiners for fruit yield per plant. These parents had also recorded high *per se* performance for the trait. Majority of their hybrids had also recorded significant and desirable *SCA* effects, in addition to high *per se* performance, for the trait, indicating their suitability in breeding programmes for development of high yielding hybrids. Among the hybrids, 14 crosses had exhibited significant and desirable *SCA* effects for fruit yield per plant. Of these, nine crosses had recorded desirable *SCA* effects in addition to high *per se* performance for the trait. An analysis of these crosses revealed the involvement of a good and a poor general combiner parent for majority of the crosses; and both good or both poor in few cases. The hybrid, PLR 1 x JBPR 1, involving both good combiner parents for fruit yield per plant, had recorded maximum fruit yield, in addition to desirable *SCA* effects for fruit yield and several other component characters. Hence, it is identified as a potential hybrid for commercial exploitation. Fixation of the heterotic effects may also be attempted through the isolation of desirable and high yielding homozygous lines for the cross.

Key words : Combining ability, Fruit yield, Round brinjal, Yield components

Brinjal is one of the most common, highly productive and popular vegetable crops grown in India. It is quite popular as the poor man's crop and is widely cultivated in Gujarat, mostly in the rainy season. Average productivity of the crop is however, reported to be low, mainly due to non-availability of suitable high yielding varieties/hybrids (Varghese and Vahab, 1994). Improvement in the productivity levels of the crop is being attempted through the exploitation of hybrid vigour. The use of hybrid cultivars of brinjal has also been predicted to increase in the country in the ensuing years (Singh, 2000), owing to low cost of hybrid seed due to higher rate of successful cross setting and large number of seeds per fruit. Information on combining ability is however, a pre-requisite for development of superior hybrids, since it helps in the identification of superior parents with better *GCA* and crosses with high *SCA* effects. Knowledge on the nature of gene action governing quantitative traits is also essential for planning systematic crop improvement programmes. In this context, the present investigation was undertaken to elucidate information on the nature of gene action and combining ability of round brinjal genotypes for fruit yield and yield component characters, in addition to identification of potential round brinjal hybrids for cultivation during rainy season.

MATERIALS AND METHODS

The experimental material comprised of ten elite homozygous lines of round brinjal, namely, KS 224, JB 64-

1-2, AB 98-10, AB 98-13, PLR 1, Gandhinagar Local, Bombay Gulabi, Morvi 4-2, Surati Ravaiya and JBPR 1 obtained from the germplasm collections maintained at the Main Vegetable Research Station, Gujarat Agricultural University, Anand and their 45 hybrids derived from the 10 x 10 diallel mating (excluding reciprocals) of these lines. The hybrids and parents were evaluated along with the check, GBH 1 in a randomized block design with three replications for fruit yield and yield component characters namely, days to first picking, plant height, primary branches per plant, fruit length, fruit diameter, fruit weight and number of fruits per plant at the Main Vegetable Research Farm, Anand.

The sowings were undertaken in the nursery during the last week of July and transplanting of the seedlings was effected 35-40 days after sowing, depending on the growth of seedlings. The normal, healthy and vigorous seedlings of each genotype were transplanted in a single row plot of 6 m length, with a spacing of 90 x 60 cm and the crop was raised following recommended package of practices.

Data was recorded on five random, competitive plants tagged for each entry, in each replication and the average values were computed. Observations for plant height and number of primary branches per plant were recorded at last picking. In contrast, data on number of fruits per plant and fruit yield per plant was obtained for each picking and the average was computed. However, for fruit yield per plant, the total of all pickings was obtained. The observations on fruit length, fruit diameter and fruit weight were recorded

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