

Hybrid Vigour in Brinjal (*Solanum melongena* L.)*

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A significant variation was observed among the 24 populations included in the experiment, for all the five characters. The highest heterosis in hybrids was recorded for days to flower (16.49) in 5147 x Vijai. Plant height (31.27) in BGR x PPL, fruit length (26.31) in PPG x T3, number of fruits / plants (85.08) in T2 x BGL and yield / plant (62.80) in T2 x BGL over better parents. Heterosis over best parent for yield/plant was also recorded in PPC x T3 which was 8.5%. Considering the yield potentiality among the crosses the cross PPC x T3 can be exploited for hybrid vigour. Its yield / ha is 513 which is 40 q/ha more yield over the best parent.

The phenomenon of heterosis or hybrid vigour in plants is well known and exploited for higher production in several crops. The earliest artificial hybridization in the egg plant was carried out by Bailey and Munson in 1889. None of the hybrids, however, exhibited any heterosis but were intermediate between the parents. The first positive report on heterosis in the egg plant came from Munson in 1892. Subsequently, Halsted (1901) reported that one of his hybrids was double the size of the parents and yielded more. In India, Rao (1934) Venkataramani (1946) and Pai and Singh (1946) reported that all the hybrids out yielded their respective parents. In the present investigation 12 crosses were made among 12 selected lines with better general combining ability and were evaluated for manifestation of heterosis

in respect of important economic characters.

MATERIAL AND METHODS

The material used in this study comprised of 12 genetically diverse parents and their 12 hybrids. These were grown in randomised block design with 4 replications at Vegetable Research Farm, Kalianpur, Kanpur. Standard agronomic practices were adopted and due care was exercised for maintaining the crop. Five plants were randomly selected for observations, viz., days to flowering, plant height (cm), fruit length (cm), number of fruits/plant and yield / plant in kg. Performance of hybrids in terms of increase or decrease over the better parent and best parent was worked out in respect of all economic characters under study.

* A part of the thesis submitted to the Kanpur University, Kanpur for the award of M.Sc. Ag-Degree by the author.

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ABBREVIATIONS USED :

1. BBL. Black Beauty long
2. BGR. Banarsi Giant Round
3. BGL. Banarsi Giant Long
4. PPC. Pusa Purple Cluster
5. PPL. Pusa Purple Long
6. T₂. Type-2
7. T₃. Type-3
8. WB. White in bunches

RESULTS AND DISCUSSION

The varietal differences were found to be significant for all the characters under study.

In respect of days to flowering, it is evident that out of 12 crosses only 4 crosses showed heterosis over respective better parents. i. e. 5174 x Vijai (-16.49); BGR x Vijai (-13.89); T₂ x BGL (-1.35) and WBxT₃ (-0.69) None of the hybrids exhibited earliness over the earliest parent (PPL). In brinjal where fruiting span is considerably wide, earliness has got special significance. However, this earliness, unless coupled with phenominally high yields, has no meaning as early varieties like PPL and BBL are already available. The cross 5147xVijai which has exhibited earliness to the extent of 16.49 per cent over the early parent, has also exhibited heterosis for yield. Therefore, this earliness can economically be utilized without sacrificing the yield which generally happens with early varieties/hybrids. Early production of fruits has also been reported by Nagai and Kide (1926) and Pal and Singh (1946).

Only five crosses out of 12 exhibited increased height over better parent. The maximum increase over better parent was observed in the cross BGR x

PPL (31.27%) followed by the hybrid 5144xBGR (23.30%). On the other hand the hybrids 5147 x Vijai (-23.47) and PPLxT₂ (-23.30) indicated maximum decrease in plant height over better parent. The level of plant height of the varieties under the study is not very high, therefore, increase in plant height may be one of the basis for increasing the yield through giving more space for branching, flowering, fruiting etc. Among the five hybrids which manifested heterosis, two have shown increased vigour to a great extent.

The variation in respect of the length of fruits is very high among the parents and it ranged from 9.50 (5147) to 27.60 cm (T₂). This range was narrowed down in the hybrids from 11.35 cm in (6309xBGR) to 25.62cm in (PPLxT₂). That hybrid PPC x T₃ with 26.31 per cent, WBxT₃ with 23.89 per cent and PPLxVijai with 2.37 per cent showed positive heterosis over better parents whereas the rest of the hybrids exhibited negative heterosis. In comparison to the longest fruit (27.60 cm) of the parent T₂ none of the crosses could reach to this level of performance.

Tremendous variation was observed for number of fruits per plant. In the parents WB (66.39) and PPC (48.39) where fruits are born in cluster, maximum number of fruits per plant was recorded. On the other hand, in variety BGR, which is a shy bearing type only 5.99 fruits per plant were harvested. In the hybrids this range was narrowed down from 9.31 (5144 x BGR) to

49.42 (PPC x T3). Out of 12 crosses only five F_1 's could excel their better parents in respect of this character. Maximum (85.08) and minimum (2.11) increase was recorded with the crosses T2 x BGL and PPC x T3 respectively. None of the hybrids could produce as many fruits per plant as in prolific bearing parents like WB and PPC. Positive hybrid vigour in the direction has also been reported by Nagai and Kida (1926) and Pal and Singh (1946).

Similarly number of fruits per plant, wide variation among the parents on yield per plant was observed. Besides the larger number of fruits per plant, maximum yield was also recorded with the parent WB. Minimum yield of 1.90 kg per plant was recorded in the parent T2. The hybrids exhibited less variation as compared to that of the parents. The maximum yield was harvested from the crosses where one of the parents is either WB or PPC, the prolific bearing types. It is very interesting to note that except in cross BBL x T₃, all the F_1 showed increase in the performance over their respective better parents. The hybrid T2 x BGL showed the maximum increase of 62.80 per cent over the better parent followed by the crosses BGR x PPL and PPL x T2. When the performance of F_1 hybrids was compared with the highest yielding parent WB, only the crosses PPC x T3 and WB x T3 could show increase favourably. These two hybrid combinations have high yield potential and can be exploited commercially for increasing per hectare yield. The positive heterosis

for yield was also reported by Nagai and Kida (1926), Pal and Singh (1946) and Odland and Nall (1948).

The author is very much thankful to Dr. Babu Singh, former Joint Director, Dr. H. N. Singh, Economic Botanist (Vegetables) and Shri S. N. Singh (SRA) for their kind interest, encouragement and valuable suggestions during the course of the investigation.

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