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## HETEROSIS FOR YIELD AND ITS CONTRIBUTING ATTRIBUTES IN BRINJAL (*SOLANUM MELONGENA* L.)

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### Summary

Thirty six F1 hybrids of brinjal, involving 9 parents were studied to work out the extent of heterosis for fruit yield and its contributing attributes during winter season, 2001-2002. Appreciable heterosis was found over better and mid parent for all the traits studied in desirable direction. In order of merit F1 hybrids Swarna Shree x CH-190, CH-190 x CH-792 and CH-190 x BL-5 were observed to be the best performer for yield as they recorded significant heterosis of 275.22, 144.14, 134.14 and 333.78, 244.65, 238.62 per cent over better and mid parent, respectively. The best heterotic hybrid Swarna Shree x CH-190 may be recommended for commercial cultivation after proper testing.

### सारांश

बैंगन में 2001-02 के शरद ऋतु के दौरान 9 पित्रों प्राप्त 36 संकरों का उपज एवं उपज को प्रभावित करने वाले गुणों के लिए ओज का अध्ययन किया गया। सभी गुणों के लिए वांछित दिशा में उत्तम पित्र व मध्य पित्र पर सराहनीय ओज पाया गया। गुणांक के अनुसार, संकर स्वर्ण श्री x सी.सी.एच.-190, सी.सी.एच.-190 x सी.सी.एच.-712 एवं सी.सी.एच.-190 x बी.एल.-5 में 275.22, 144.14 और 333.78, 244.65, 238.62 प्रतिशत क्रमशः उत्तम पित्र एवं मध्य पित्र पर सार्थक ओज पाया गया। सबसे अधिक संकर ओज देने वाले संकर स्वर्ण श्री x सी.सी.एच.-190 को आवश्यक परीक्षण के बाद व्यवसायिक खेती के लिए संस्तुति की जा सकती है।

### Introduction

Brinjal or eggplant (*Solanum melongena* L.) is an important vegetable crop of Indian Sub continent and rich variability exist both in cultivated type and its wild species. Hybrid vigour in brinjal was probably first reported by Nagai and Kida (1926) in a cross combination of some Japanese varieties of brinjal. To obtain high yield per unit area, exploitation of hybrid vigour is one of the good way and particularly in crop like brinjal, where more seeds per fruit are obtained. Therefore, the present investigation was carried out to study the extent of heterosis

in F1 hybrid over better and mid parent in a diallel cross set of 9 parents excluding reciprocals.

### Materials and Methods

Nine genetically pure diverse genotypes line namely, Swarna Shree, CH-190, CH-586, CH-757, CH-792, BL-3, BL-5, BL-9 and BL-22 was used to develop 36 F1 excluding reciprocal crosses. The seedlings were transplanted on August 8, 2001 in randomized block design having inter and intra row spacing of 60 x 45 cm with three replication. Observations were recorded on 10 randomly selected plants in each

Table-1: Range of mean values of parents F1 hybrids and heterosis percent for eight traits in brinjal

Top parents on the basis of mean value	Fruit yield (q/ha)	Average weight (g)	fruit Fruit (cm)	length Fruit breadth (cm)	Fruit firmness (kg/CM <sup>2</sup> )	Days to first No. flowering	branches/plant	of Plant height (cm)
Top three BP BP F1s with heterosis (%) over	BL-9(576.51)	CH-586(250.0)	Round: 757(7.0)	CH- Swarna Shree (8.35)	CH-757 (9.29)	CH-586 (38.87)	BL-22 (5.33)	BL-22 (102.67)
	Swarna Shree x CH-792 x CH-190(275.22)	BL-9 Round (67.44)	Long:BL-3 (13.95)	to Swarna Shree	CH-792 x BL- x 5 (41.27)		CH-190x CH-792 (36.17)	CH-190 CH-757 (21.81)
	CH-190xCH-792 Swarna Shree CH-190 (49.32)	Shree x BL-3 (-CH-792 40.50)	Shree x BL-3 (-CH-792 40.50)	CH-757x BL-3 (-BL-5 x BL-CH-757 x BL- 22 (35.96) 3 (32.54)			BL-3 x BL-5 (31.03)	Swarna Shree x BL-9 (18.61)
	CH-190xBL-5 BL-3 x BL-9 Swarna Shree x CH-792 (134.14)	BL-3 (41.86)	BL-22 (-33.38)	BL-9 (22.42)				CH-586 x BL-3 (17.92)
Top three F1s MP with heterosis (%) over	Swarna Shree x CH-792 x CH-190 (333.78)	BL-9 Round (160.87)	Round oblong 586x BL-9 (- (83.73) 33.95)	to CH-792 CH- BL-9 (33.50)	CH-792 x BL- CH-190 x BL- CH-190x (37.43) 22		CH-792 CH-190x (40.66)	CH-792xBL- 22 (28.65)
	CH-190xBL-5	CH-792xBL-5 (80.39)	Long:CH- 190xCH-257 (30.31)	to CH- Swarna 792xBL-5				
	CH-190 x CH- Swarna Shree CH-190 (238.62)	CH-190 (49.32)	Round oblong Shree x BL-3 (- (61.85) 32.12)	to CH- Swarna 792xBL-5 Shree x BL-3 (- (61.85) 32.12)	CH-757xBL-3 CH-190 (31.49)	CH-792	BL-3 x BL-5 (36.94)	CH-190 x BL-3 (27.18)
			Long:BL-3 x BL- 22 (25.90)	to BL-5 x BL- BL-5 x BL-22 CH-190 x BL- CH-757 x BL-5 (39.75) (23.06) 3 (-12.10) (30.77)				
			Round oblong Shree x BL-22 (- 29.47)					
			Long:BL-3 x BL- 5 (16.58)					

treatment over replication for eight quantitative traits viz, fruit yield (q/ha), average fruit weight (g), fruit length (cm), fruit breadth (cm), fruit firmness (kg/cm<sup>2</sup>), day to first flowering, number of branches per plant and plant height (cm). Heterosis was calculated as percentage of F1 performance in desirable direction over better and mid parent for each treatment. The best parental line was assessed individually for the different traits based on their performance in the diallel experiment.

### Results and Discussion

Wide range of variability exist among parents and their F1 hybrids for different traits under study. The range of heterosis percentage in F1 crosses varied from -68.80 to 275.22 and -72.16 to 333.75 for fruit yield, -61.54 to 67.44 and -58.06 to 160.87 for average fruit weight, -40.50 to 11.07 and -33.45 to 30.31 for fruit breadth, -39.47 to 41.27 and -39.12 to 31.49 for fruit firmness, -8.43 to 59.40 and -13.06 to 42.62 for days to first flowering, -52.73 to 50.68 and -53.98 to 40.66 for number of branches per plant, -63.10 to 21.81 and -59.35 to 28.65 for plant height over their better and mid parent, respectively. Out of the 36 hybrids, the significant desirable heterotic effects over their respective better and mid parent were noticed in 15 and 16 crosses for fruit yield, 5 and 6 for average fruit weight, 17 and 12 for round to oblong fruit, 0 and 5 for long fruit, 6 and 6 for fruit breadth, 4 and 5 for fruit firmness, 0 and 5 for early flowering, 2 and 7 for number of branches per plant, 3 and 6 for plant weight.

The best performing hybrids along with their heterosis percentage over better and mid parents for different traits were Swarna Shree x CH-190 (275.22) and Swarna Shree x CH-190 (333.78) for fruit yield CH-792 x BL-9 (67.44) and CH-792 x BL-9 (160.87) for average fruit weight, Swarna Shree x BL-3 (-40.50) and CH-586 x BL-

9 (-33.95) for round to oblong fruit, nil and CH-190 x CH-257 (30.31) for long fruit size, Swarna Shree x CH-792 (48.91) and CH-792 x BL-9 (83.73) for fruit breadth, CH-792 x BL-5 (41.27) and CH-792 x BL-5 (37.43) for fruit firmness, CH-190 x CH-792 (36.17) and CH-190 x CH-792 (40.66) for number of branches per plant, CH-190 x CH-757 (21.81) and CH-792 x BL-22 (28.65) for plant height. None of the hybrid was found desirable for early flowering over better parent. However, CH-190 x BL-22 (-13.06) was found earliest in flowering over mid parent.

In the rank of merit three hybrids namely Swarna Shree x CH-190, CH-190 x CH-792, CH-190 x BL-5 were observed to be the best performing hybrids for fruit yield are both better and mid parent. In accordance with the findings Dixit et al. (1982) observed hybrid vigour in brinjal with respect to total yield the most of its contributory traits. Similar findings have also been reported by Singh (1998), Patil and Shinde (1984) and Mankar et al. (1995).

### References

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