International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(5): 805-816

Received: 08-07-2019
Accepted: 14-08-2019

Kuldeep Kumar
Department Vegetable Science, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

DP Singh
Department Vegetable Science, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Meenakshi Kumari
Department Vegetable Science, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Kanhaiya Lal
Department of Genetics and Plant Breeding, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

IN Shukla
Department of Vegetable Science, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

Mahendra Chaudhary
Department Vegetable Science, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Correspondence
Kuldeep Kumar
Department Vegetable Science, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Exploitation of heterosis for yield and its contributing traits in brinjal (*Solanum melongena* L.)

Kuldeep Kumar, DP Singh, Meenakshi Kumari, Kanhaiya Lal, IN Shukla and Mahendra Chaudhary

Abstract
The present investigation was carried out to study genetic parameters for fifteen yield and its contributing characters in 64 (48 F_1s, 12 lines and 4 testers) entries with two check varieties during *Kharif* 2017-18 (Y_1) to 2018-19 (Y_2). In Y_1 heterosis over mid parent for total fruit yield per plant ranged from -55.50 to 98.18 percent and standard heterosis from -55.22 to 94.04 percent. In Y_2, heterosis over mid parent for total fruit yield per plant ranged from -55.05 to 99.20 percent and standard heterosis from -58.64 to 79.09 percent. In the case of pooled analysis, heterosis over mid parent for total fruit yield per plant ranged from -55.78 to 98.65 percent and standard heterosis from -56.87 to -85.78 percent. In Y_1 Out of 48 crosses, twenty-eight and twenty-two of the F_1's showed significant and positive heterosis over mid parent and standard heterosis for total fruit yield per plant respectively. InY_2 out of 48 crosses, twenty-nine and eighteen of the F_1's showed significant and positive heterosis over mid parent and standard heterosis for total fruit yield per plant respectively. In pooled analysis out of 48 crosses, twenty-eight and twenty- one of the F_1's showed significant and positive heterosis over mid parent and standard heterosis for total fruit yield per plant respectively.

Keywords: Heterosis, yield and its contributing traits and brinjal (*Solanum melongena* L.)

Introduction
Vegetable play a major role in Indian agriculture by providing food, nutritional and economic security and producing higher returns per unit area. In addition, vegetable have higher productivity, shorter maturity cycle, high value and provide greater income leading to improved livelihoods. Vegetable are of considerable importance in human nutrition. Generally, they are rich in vitamins and minerals, low in calories and also supply fiver. India occupy second rank for vegetable production in world after China.

Eggplant (*Solanum melongena* L.) or brinjal is a solanaceous vegetable, which is worldwide known as Aubergine or guinea squash, is one of the most popular and major vegetable crops in India and other parts of the world. It is a self-pollinated and annual herbaceous plant, probably originated in India and shows secondary diversity in South East Asia. It is being grown extensively in India, Bangladesh, Pakistan, China, Japan, Philippines, France, Italy and U.S.A. In Southern Europe, brinjal is a staple vegetable and it is a favorite dish in South East of France. Brinjal has got much potential as raw material in pickle making and dehydration industries (Singh *et al*., 1963). It is highly productive and usually finds its place as the poor man's vegetable. In India, it is being consumed as a cooked vegetable in many ways and is liked by both poor and rich. Around the year availability, easy culture, moderate to high yield and consumption in varieties of ways like salad, bhaji, stuffed brinjal, bhartha, chatni, pickles etc., has made brinjal the king of vegetables in India. Further, in recent years brinjal is being exported in the form of products like *baingan bhartha, chatni, pickles* etc. to Middle East countries.

Brinjal is being cultivated in India over an area of 0.733 million ha. With an average annual production of 12.510 million tonnes and productivity of 17.06 mt/ha. In Uttar Pradesh, brinjal is being cultivated on an area of 3.0 lakh ha. With annual production of 90.9 lakh tonnes. In Uttar Pradesh, Agra, Meerut, Lucknow, Kanpur, Aligarh, Chitrakoot and Gorakhpur districts contribute more area and production to the state pool (Anon., 2016-17).

Looking to the increasing

Population, it is clear that we are not meeting the demand at present. So eggplant welcomes breeders for improvement for the reasons cited above. There are specific genotypes suited for specific preparations apart from the large genetic variation observed with regard to colour, shape and size of fruits. In addition, variation is also noticed for characters like vegetative growth, maturity and presence or absence of spines on leaves, stem and fruit calyx among the indigenous material. To have such kind of plant profile, we have to have some different breeding methods. One of such method is exploitation of hybrid vigour through hybridization. Bailey and Munson (1892) reported artificial hybridization in brinjal for the first time. However, none of the hybrids exhibited any heterosis. Nagai and Kida (1926) were probably the first to observe hybrid vigour, hoping some commercial acceptance in crosses among some Japanese varieties. Since then many public and private sectors have developed various hybrids in India, but these hybrids lacked regional preferences for colour, shape and presence or absence of spines and lacked suitability to specific product preparations.

Therefore, the exploitation of hybrid vigour in brinjal has been recognized as a practical tool in providing the breeder a means of increasing yield and other economic characters. Most of the local varieties which are grown by farmers in India have not been fully utilized in any genetic improvement programme on scientific line. The development of an effective heterosis breeding programme in brinjal needs to elucidate the genetic nature and magnitude of quantitatively inherited traits and judge the potentiality of parents in hybrid combinations.

The heterosis breeding programme mainly depends on the choice of superior parents for hybridization and the knowledge of combining ability and magnitude of gene action involved in the expression of component traits. Among the various mating designs line to tester cross techniques has been most frequently used to determine nature and magnitude of gene action through the estimate of genetic components, general and specific combining ability variances and their effects in many self, often-cross and cross-pollinated crops. In brinjal several workers have used this design for estimating components of variation and combining ability (Vaddoriya *et al.*, 2007; Ramireddy *et al.*, 2011; Shafeeq *et al.*, 2007 and Reddy and Patel 2010) [11, 8, 10].

The high level of heterosis in desirable direction coupled with high sca variance and non-additive type of gene action have also been reported in several major economic traits of brinjal including yield by Ram and Singh (2007) [7]; Reddy and Patel (2014) [9]; Kaur *et al.* (2001); Chadha *et al.* (2001) [4]; Mohanty and Prusti (2003) [6] and Bavage *et al.* (2005) [3] indicating thereby ample scope of exploitation of hybrid vigour in brinjal. Heritability estimates along with genetic advance are normally more helpful in predicting the gain under selection than heritability estimates alone. However, it is not necessary that a character showing high heritability will also exhibit high genetic advance (Johnson *et al.*, 1955).

Materials and Methods

The present investigation was carried out at the Vegetable Research Farm Department of Vegetable Science, Kalyanpur, C. S. Azad University of Agriculture and Technology, Kanpur. The experimental materials for the present investigation consisted of 64 (48 F_1s, 12 lines and 4 testers) genotypes with two check varieties of brinjal *viz.,* Azad Brinjal-1, Pusa purple long. The experiment was laid out in a Randomized Block Design (RBD) with three replications. Each replication consisted of 64 genotypes and two check varieties. 30 days old seedlings were transplanted 60cm apart between rows and 60 cm within the row. All the recommended cultural practices were followed to raise a good crop. Observations were recorded randomly on five competitive normal looking plants from each treatment in each replication to record the observations *viz* days to 50% flowering, number of flowers per inflorescence, leaf length (cm), leaf width (cm), number of primary branches per plant, plant height (cm), number of fruits per cluster, fruit length (cm), fruit circumference (cm), number of fruits per plant, average fruit weight (g), specific gravity, dry matter content, total soluble solids (TSS), and total fruit yield per plant (kg).

Results and Discussion

In over pooled, heterosis for days to 50 per cent flowering over mid parent ranged from –20.39 per cent (KS-8307 × Azad B-2) to 25.27 per cent (KS-8206 × Azad B-4). Out of forty eight crosses, twenty one F_1's showed significant heterosis over mid parent in positive direction. However, over mid parent, twenty- three crosses showed heterosis in negative direction. The best five crosses were KS-8307 × Azad B-2 (-20.39%), KS-7843 × Azad B-3 (-16.17), KS-8312 × Azad Kranti (-15.92%), KS-7843 × Azad B-4 (-15.59%) and KS-5803 × Azad B-3 (-14.77%). The heterosis over standard variety ranged from -25.57 to 16.19 per cent for cross KS-8206 × Azad B-4 and KS-7843 × Azad B-2, respectively. Out of forty-eight crosses, fourteen F_1's exhibited significant heterosis over standard variety in positive direction. However, over standard variety, thirty one crosses showed significant heterosis in negative direction The best five crosses were KS-8206 × Azad B-4 (-25.57%), KS-8206 × Azad B-3 (-24.15%), KS-6301 × Azad B-4 (-23.01%), KS-8206 × Azad Kranti (-22.74%) and KS-8307 × Azad B-2 (-17.19%).

In over pooled, heterosis for number of flowers per inflorescence over mid parent ranged from –17.57 per cent (KS-8307 × Azad Kranti) to 58.16 per cent (KS-5804 × Azad B-4). Out of forty eight crosses, forty five F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-5804 × Azad B-4 (58.16%), KS-7853 × Azad B-2 (49.29%), KS-8206 × Azad B-2 (41.27%), KS-8307 × Azad B-2 (37.17%) and KS-5804 × Azad B-2 (36.49%). However, over mid parent, three crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -20.75 to 34.25 per cent for cross KS-8307 × Azad Kranti and KS-7811 × Azad B-4, respectively. Out of forty-eight crosses, forty-five F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-7811 × Azad B-4 (34.25%), KS-7811 × Azad Kranti (31.25%), KS-7853 × Azad B-2 (31.25%), KS-5804 × Azad B-4 (29.25%) and KS-7853 × Azad Kranti (26.25%). However, over standard variety, three crosses showed significant heterosis in negative direction for number of flowers per inflorescence.

In over pooled, heterosis for leaf length over mid parent ranged from –14.88 per cent (KS-8307 × Azad B-2) to 30.68 per cent (KS-7853 × Azad Kranti). Out of forty eight crosses, twenty nine F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-7853 × Azad Kranti (30.68%), KS-8312 × Azad B-4 (25.78%), KS-7811 × Azad Kranti (23.24%), KS-5803 × Azad Kranti (23.39%) and KS-6301 × Azad B-4 (15.67%). However, over mid parent, ten crosses showed heterosis in negative direction.

The heterosis over standard variety ranged from -7.54to 17.01 per cent for cross KS-8206 × Azad B-4 and KS-8312 × Azad B-4, respectively. Out of forty-eight crosses, twenty-five F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-8312 × Azad B-4 (17.01%), KS-8204 × Azad B-2 (16.22%), KS-7570 × Azad B-2 (15.92%), KS-8206 × Azad B-3 (15.30%) and KS-7570 × Azad B-4 (12.55%). However, over standard variety, ten crosses showed significant heterosis in negative direction for leaf length.

In over pooled, heterosis for leaf width over mid parent ranged from –21.47 per cent (KS-8312 × Azad B-3) to 16.99 per cent (KS-8206 × Azad B-3). Out of forty-eight crosses, twenty-five F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-8206 × Azad B-3 (16.99%), KS-7871 × Azad Kranti (16.87%), KS-6301 × Azad B-3 (15.62%), KS-8206 × Azad Kranti (15.33%) and KS-8206 × Azad B-2(13.71%). However, over mid parent, twenty crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -17.70 to 15.15 per cent for cross KS-7871 × Azad Kranti and KS-8307 × Azad B-3, respectively. Out of forty-eight crosses, twenty-one F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-8307 × Azad B-3 (15.15%), KS-8204 × Azad B-3 (8.53%), KS-8307 × Azad B-2 (8.45%), KS-7811 × Azad B-4 (8.29%) and KS-7843 × Azad B-4 (7.66%). However, over standard variety, twenty-five crosses showed significant heterosis in negative direction for leaf width.

In over pooled, heterosis for number of primary branches per plant over mid parent ranged from -24.37 per cent (KS-5804 × Azad B-3) to 24.81 per cent (KS-7853 × Azad Kranti). Out of forty eight crosses, twenty three F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-7853 × Azad Kranti (24.81%), KS-6301 × Azad B-2 (24.40%), KS-6301 × Azad Kranti (18.88%), KS-7853 × Azad B-4 (17.68%) and KS-8206 × Azad Kranti (17.21%). However, over mid parent, twenty-five crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -14.42 to 32.32 per cent for cross KS-5804 × Azad B-3 and KS-6301 × Azad B-2, respectively. Out of forty- eight crosses, forty-two F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-6301 × Azad B-2 (32.32%), KS-7811 × Azad B-3 (31.18%), KS-8307 × Azad Kranti (27.38%), KS-5804 × Azad Kranti (24.71%) and KS-7811 × Azad B-4 (24.33%). However, over standard variety, six crosses showed significant heterosis in negative direction for number of primary branches per plant.

In over pooled, heterosis for plant height over mid parent ranged from -5.25 per cent (KS-8307 × Azad Kranti) to 35.97 per cent (KS-5804 × Azad Kranti). Out of forty eight crosses, forty one F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-5804 × Azad Kranti (35.97%), KS-5804 × Azad B-3 (33.00%), KS-5804 × Azad B-4 (32.75%), KS-7811 × Azad B-3 (32.70%) and KS-7871 × Azad B-3 (26.87%). However, over mid parent, one cross showed heterosis in negative direction. The heterosis over standard variety ranged from -12.22 to 30.19 per cent for cross KS-7853 × Azad B-2 and KS-8204 × Azad Kranti, respectively. Out of forty-eight crosses, twenty-nine F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-8204 × Azad Kranti (30.19%), KS-5804 × Azad Kranti (20.74%), KS-7871 × Azad B-3 (19.90%), KS-7811 × Azad B-3 (18.12%) and KS-6301 × Azad B-2 (15.85%). However, over standard variety, two crosses showed significant heterosis in negative direction for plant height.

In over pooled heterosis for number of fruits per cluster over mid parent ranged from -23.53 per cent (KS-8204 × Azad B-3) to 25.00 per cent (KS-8206 × Azad B-2). Out of forty eight crosses, twenty five F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-8206 × Azad B-2 (25.00%), KS-6301 × Azad B-2 (20.24%), KS-7853 × Azad B-2 (14.45%), KS-7853 × Azad B-3 (13.29%) and KS-7843 × Azad Kranti (11.90%). However, over mid parent, twenty-three cross showed heterosis in negative direction. The heterosis over standard variety ranged from -16.92 to 29.23 per cent for cross KS-8312 × Azad B-3 and KS-6301 × Azad B-2, respectively. Out of forty-eight crosses, eighteen F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-6301 × Azad B-2 (29.23%), KS-7853 × Azad B-2 (26.92%), KS-5804 × Azad B-2 (26.92%), KS-7843 × Azad Kranti (20.77%) and KS-5803 × Azad Kranti (13.85%). However, over standard variety, nine crosses showed significant heterosis in negative direction for number of fruits per cluster.

In over pooled, heterosis for fruit length over mid parent ranged from -44.89 per cent (KS-7811 × Azad B-2) to 54.27 per cent (KS-8312 × Azad Kranti). Out of forty eight crosses, thirty one F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-8312 × Azad Kranti (54.27%), KS-8206 × Azad Kranti (47.52%), KS-6301 × Azad B-2 (45.04%), KS-5804 × Azad Kranti (41.72%) and KS-8312 × Azad B-3 (37.23%). However, over mid parent, seventeen crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -59.20 to 26.53 per cent for cross KS-7811 × Azad B-2 and KS-7811 × Azad B-3, respectively. Out of forty-eight crosses, fifteen F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-7811 × Azad B-3 (26.53%), KS-5803 × Azad Kranti (26.20%), KS-7843× Azad B-3 (24.02%), KS-8312 × Azad Kranti (22.27%) and KS-8206 × Azad Kranti (20.53%). However, over standard variety, thirty-two crosses showed significant heterosis in negative direction for fruit length.

In over pooled, heterosis for fruit circumference over mid parent ranged from -34.80 per cent (KS-8312 × Azad Kranti) to 54.34 per cent (KS-5803 × Azad B-2). Out of forty eight crosses, thirty eight F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-5803 × Azad B-2 (54.34%), KS-8204 × Azad B-2 (52.99%), KS-7570 × Azad B-2 (41.31%), KS-7811 × Azad B-2 (41.14%) and KS-7843× Azad B-4 (38.53%). However, over mid parent, nine crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -1.43 to 143.32 per cent for cross KS-8206 × Azad Kranti and KS-8312 × Azad B-2, respectively. Out of forty-eight crosses, forty-six F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-8312 × Azad B-2 (143.32%), KS-6301 × Azad B-2 (140.79%), KS-8204× Azad B-2 (133.40%), KS-5803 × Azad

B-2 (132.49%) and KS-7843 × Azad B-4 (121.46%). However, over standard variety, one cross showed significant heterosis in negative direction for fruit circumference.

In over pooled, heterosis for number of fruits per plant over mid parent ranged from -33.10 per cent (KS-8307 × Azad B-2) to 79.04 per cent (KS-6301 × Azad Kranti). Out of forty eight crosses, thirty six F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-6301 × Azad Kranti (79.04%), KS-8206 × Azad B-2 (69.77%), KS-7871 × Azad B-2 (61.63%), KS-5803 × Azad B-2 (55.33%) and KS-8206× Azad B-2 (53.86%). However, over mid parent, eleven crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -25.33 to 69.68 per cent for cross KS-8307 × Azad B-2 and KS-7871 × Azad B-2, respectively. Out of forty-eight crosses, thirty-two F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-7871 × Azad B-2 (69.68%), KS-6301 × Azad Kranti (65.39%), KS-5804× Azad B-3 (61.57%), KS-7853 × Azad B-4 (46.77%) and KS-8312 × Azad B-4 (38.97%). However, over standard variety, sixteen crosses showed significant heterosis in negative direction for number of fruits per plant.

In over pooled, heterosis for average fruit weight over mid parent ranged from -57.73 per cent (KS-7871 × Azad B-4) to 74.98 per cent (KS-8312 × Azad Kranti). Out of forty eight crosses, twenty four F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-8312 × Azad Kranti (74.98%), KS-6301× Azad B-3 (72.63%), KS-6301 × Azad Kranti (68.14%), KS-8206 × Azad B-3 (47.47%) and KS-78× Azad B-2 (39.30%). However, over mid parent, twenty-one cross showed heterosis in negative direction. The heterosis over standard variety ranged from -52.59 to 44.36 per cent for cross KS-8307 × Azad Kranti and KS-8307 × Azad B-4, respectively. Out of forty-eight crosses, seventeen F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-8307 × Azad B-4 (44.36%), KS-8206 × Azad B-3 (43.94%), KS-7871× Azad B-3 (40.42%), KS-8307 × Azad B-2 (29.50%) and KS-8204 × Azad B-4 (28.25%). However, over standard variety, twenty-eight crosses showed significant heterosis in negative direction for average fruit weight.

In over pooled, heterosis for specific gravity over mid parent ranged from -28.46 per cent (KS-8307 × Azad B-3) to 28.44 per cent (KS-7570 × Azad B-4).Out of forty eight crosses, thirty eight F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-7570 × Azad B-4 (28.44%), KS-7853× Azad B-3 (27.85%), KS-8204 × Azad B-2 (26.22%), KS-5803 × Azad B-4 (25.21%) and KS-8312× Azad Kranti (22.04%). However, over mid parent, ten crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -12.87 to 42.57 per cent for cross KS-8307 × Azad B-3 and KS-7570 × Azad B-4, respectively. Out of forty-eight crosses, twenty-four F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-7570 × Azad B-4 (42.57%), KS-5803 × Azad B-4 (25.74%), KS-6301× Azad B-4 (22.77%), KS-7853 × Azad Kranti (20.79%) and KS-8206× Azad Kranti (13.86%). However, over standard variety, twelve crosses showed significant heterosis in negative direction for specific gravity.

In over pooled, heterosis for dry matter content over mid parent ranged from -32.94 per cent (KS-7811 × Azad B-3) to 55.57 per cent (KS-6301 × Azad Kranti). Out of forty-eight crosses, thirty-seven F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-6301 × Azad Kranti (55.57%), KS-7570× Azad Kranti (49.22%), KS-8312 × Azad Kranti (45.23%), KS-8312 × Azad B-2 (41.47%) and KS-5804× Azad B-2 (36.55%). However, over mid parent, nine crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -17.72 to 56.69 per cent for cross KS-7843 × Azad B-3 and KS-8312 × Azad B-2, respectively. Out of forty-eight crosses, thirty-eight F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-8312 × Azad B-2 (56.69%), KS-8204 × Azad B-3 (56.10%), KS-8204× Azad B-2 (44.88%), KS-7570 × Azad Kranti (42.91%) and KS-8312× Azad Kranti (40.75%). However, over standard variety, ten crosses showed significant heterosis in negative direction for dry matter content.

In over pooled, heterosis for total soluble solids over mid parent ranged from -43.82 per cent (KS-8312 × Azad B-4) to 44.98 per cent (KS-6301 × Azad B-3). Out of forty eight crosses, twenty seven F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-6301 × Azad B-3 (44.98%), KS-8206× Azad B-4 (44.07%), KS-6301 × Azad B-4 (41.51%), KS-8307 × Azad Kranti (32.16%) and KS-5804× Azad Kranti (30.30%). However, over mid parent, twenty- one crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -34.29 to 37.75 per cent for cross KS-6301 × Azad B-3 and KS-8312 × Azad Kranti, respectively. Out of forty-eight crosses, twenty-nine F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-8312 × Azad Kranti (37.75%), KS-7843 × Azad B-2 (37.46%), KS-5804× Azad Kranti (36.89%), KS-7811 × Azad B-4 (31.99%) and KS-7843× Azad B-3 (31.70%). However, over standard variety, twelve crosses showed significant heterosis in negative direction for total soluble solids.

In over pooled, heterosis for fruit yield per plant over mid parent ranged from -55.78 per cent (KS-7843 × Azad B-3) to 98.65 per cent (KS-6301 × Azad Kranti). Out of forty eight crosses, twenty eight F_1's showed significant heterosis over mid parent in positive direction. The best five crosses were KS-6301 × Azad Kranti (98.65%), KS-6301× Azad B-3 (98.17%), KS-8206 × Azad B-3 (82.82%), KS-5804 × Azad B-3 (80.98%) and KS-7570× Azad B-2 (65.65%). However, over mid parent, twenty crosses showed heterosis in negative direction. The heterosis over standard variety ranged from -56.87 to 85.78 per cent for cross KS-7843 × Azad B-3 and KS-8307 × Azad B-4, respectively. Out of forty-eight crosses, twenty-one F_1's exhibited significant heterosis over standard variety in positive direction. The best five F_1's showing standard heterosis over standard variety in positive direction were KS-8307 × Azad B-4 (85.78%), KS-6301 × Azad Kranti (83.89%), KS-5804× Azad B-3 (81.52%), KS-8204 × Azad B-4 (63.98%) and KS-5804× Azad B-2 (55.45%). However, over standard variety, twenty-seven crosses showed significant heterosis in negative direction for fruit yield per plant.

The exploitation of heterosis refers as the superiority of F_1 hybrid over its parent in terms of yield and its attributing

traits. The exploitation of heterosis requires an intensive evaluation of germplasm to find out diverse donors with high nicking of genes and further identification of heterotic crosses. In present study, the estimates of heterosis over mid-parent and standard variety (pusa purple long) over two years and pooled were calculated for 48 F_1's to assess their genetic potential as breeding material and presented in table-1 and summarized in table-2.

Perusal of table-1 revealed that nature and magnitude of heterosis differed for different traits and over seasons in various hybrid combinations. In case of total fruit yield per plant, in Y_1 the over mid parent ranged from -55.50 to 98.18 per cent and standard heterosis from -55.22 to 94.04 per cent, in Y_2, over mid parent ranged from -55.05 to 99.20 per cent and standard parent from -58.64 to 79.09 per cent and in pooled, over mid parent from -55.78 to 98.65 per cent and standard parent from -56.87 to -85.78 per cent. Out of 48 crosses, in Y_1 twenty-eight and twenty two of the F_1's showed significant and positive heterosis over Mid parent and standard heterosis respectively, out of 48 crosses, inY_2 twenty nine and eighteen of the F_1's showed significant and positive heterosis over Mid parent and standard heterosis respectively and out of 48 crosses, in pooled twenty eight and twenty one of the F_1's showed significant and positive heterosis over Mid parent and standard heterosis respectively. A perusal of table-5.2 revealed that crosses exhibiting significant and negative estimates of heterosis for one or both types of heterosis for total fruit yield also exhibited significant and positive estimates heterosis for other important yield and yield attributing traits. The above results are in conformity with the findings of Babu and Thirumurugan (2000) [2], Kanthaswamy *et al*. (2003) [5], Bavage *et al*. (2005) [3], Vaddoriya *et al*. (2007) [11], Shafeeq *et al*. (2007) [10] and Ramireddy *et al*. (2011) [8].

For days to 50% flowering traits negative heterosis is desirable. Since hybrids with heterosis for earliness produce first fruit earlier as compared to parents, thereby increasing their productivity per day per unit area and as a consequence fetch good prices in the market by early supply of produce. A close examination of heterosis value of days to 50% flowering revealed that Out of 48 crosses, in Y_1 twenty one and thirty four of the F_1's showed significant and negative heterosis over Mid parent and standard heterosis respectively, inY_2 twenty three and twenty eight of the F_1's showed significant and negative heterosis over Mid parent and standard heterosis respectively and in pooled twenty three and thirty one of the F_1's showed significant and negative heterosis over Mid parent and standard heterosis respectively for days to 50% flowering (Table-1).

A perusal of Table-2 which showed best five crosses on the basis of desirable and significant heterosis for fifteen traits in both the years and over pooled revealed that common crosses on the basis of *per se* performance (Table-3) Since, earliness, desirable fruit shape, size, colour, number of fruits and fruit yield are important consideration for choice of elite high yielding F_1 hybrids. The decision for final selection of a hybrid for commercial cultivation should also take into account the earlier mentioned features. Out of 48 crosses, in Y_1 twenty eight and twenty two of the F_1's showed significant and positive heterosis over Mid parent and standard heterosis respectively, inY_2 twenty nine and eighteen of the F_1's showed significant and positive heterosis over Mid parent and standard heterosis respectively and in pooled twenty eight and twenty one of the F_1's showed significant and positive heterosis over Mid parent and standard heterosis respectively for fruit yield (Table-4.5). Besides fruit yield per plant, substantial heterosis over mid-parent and standard variety was also observed in negative as well as positive direction for remaining characters in both the years (Table-1). However, the number of crosses showing significant estimates and the range of heterosis varied from one character to another. In general, mostly crosses showed appreciable and high heterosis for number of traits under study. The existence of wide spectrum of heterosis in either direction with expression of high degree of desirable heterosis by some crosses for number of traits observed in present study is in conformity with the earlier reports of high heterosis for such characters in brinjal Babu and Thirumurugan (2000) [2], Kanthaswamy *et al*. (2003) [5], Bavage *et al.* (2005) [3], Vaddoriya *et al*. (2007) [11], Shafeeq *et al.* (2007) [10] and Ramireddy *et al.* (2011) [8].

Table 1: Estimates of heterosis (%) over mid parent (MP) and standard variety (SV) Pusa purple long in the pooled analysis

Crosses	Days to 50% flowering		Number of flowers per inflorescence		Leaf length (cm)		Leaf width (cm)		Number of primary branches per plant		Plant height (cm)	
	Pooled		Pooled		Pooled		Pooled		Pooled		Pooled	
	MP	SV	MP	SV	MP	SV	MP	SV	MP	SV	MP	SV
KS-7570×Azad B-2	-10.27**	-5.69**	32.41**	20.00**	13.87**	15.92**	-3.64**	-1.44**	6.05**	16.73**	**MP**	**SV**
KS-7570×Azad B-4	-6.39**	-4.26**	-7.69**	-10.00**	16.27**	12.55**	-3.07**	-0.72	-4.81**	12.93**	-0.29	-6.33**
KS-7570×Azad B-3	-4.31**	-8.52**	21.56**	23.25**	-4.12**	2.21**	-7.54**	-3.59**	-7.61**	11.41**	4.07*	-2.54
KS-7570×Azad kranti	-6.18**	-5.11**	22.76**	22.5**	5.74**	1.00	5.57**	-3.19**	-3.23**	23.57**	13.50**	9.91**
KS-8204×Azad B-2	-13.32**	-8.52**	21.07**	4.25**	15.86**	16.22**	2.04**	2.79**	6.43**	15.21**	5.68**	5.22*
KS-8204×Azad B-4	7.88**	10.79**	16.14**	8.00**	6.77**	1.75	-12.29**	-11.48**	-1.36**	15.21**	6.05**	3.54
KS-8204×Azad B-3	-3.55**	-7.40**	12.69**	9.25**	6.68**	12.13**	5.68**	8.53**	-5.32**	12.93**	3.43	0.67
KS-8204×Azad Kranti	-13.29**	-11.93**	25.16**	19.25**	9.76**	3.17**	4.28**	-5.98**	-17.59**	3.80**	9.18**	9.73**
KS-7843×Azad B-2	1.11	16.19**	19.12**	1.25**	0.05	6.92**	-5.85**	3.11**	-5.26**	2.66**	26.10**	30.19**
KS-7843×Azad B-4	-15.59**	-5.40**	23.81**	13.75**	-1.52	0.33	-1.84**	7.66**	-8.94**	6.46**	16.04**	11.80**
KS-7843×Azad B-3	-16.17**	-11.66**	5.65**	1.25**	-8.50**	2.17**	-8.74**	1.75**	2.66**	22.43**	10.57**	6.19**
KS-7843×Azad Kranti	-4.74**	5.68**	15.04**	8.25**	4.59**	5.21**	5.31**	4.15**	-1.01**	24.71**	10.23**	9.38**
KS-5803×Azad B-2	-2.57**	7.67**	41.01**	22.5**	5.32**	0.08	-9.93**	-7.42**	-2.30**	7.60**	0.05	2.02
KS-5803×Azad B-4	-12.14**	-5.40**	26.22**	18.25**	4.87**	-5.59**	-12.74**	-10.13**	-13.60**	2.66**	6.41**	2.68
KS-5803×Azad B-3	-14.77**	-13.93**	18.12**	15.5**	-4.06**	-4.21**	1.00**	5.82**	-6.81**	12.93**	5.66**	1.63
KS-5803×Azad Kranti	6.67**	13.64**	23.21**	18.25**	22.39**	8.59**	12.11**	3.43**	-17.82**	5.32**	0.78	0.15
KS-7811×Azad B-2	-1.16*	8.52**	4.39**	-0.75**	6.36**	3.29**	2.11**	4.07**	-2.96**	3.80**	-3.45	-1.41
KS-7811×Azad B-4	-13.15**	-7.11**	31.70**	34.25**	16.30**	7.13**	6.07**	8.29**	7.40**	24.33**	20.80**	4.05
KS-7811×Azad B-3	-1.13	-0.85	-6.30**	-0.75**	-1.26	0.63	1.25**	5.18**	11.29**	31.18**	22.33**	5.00*
KS-7811×Azad Kranti	-6.31**	-0.85	26.00**	31.25**	23.24**	11.92**	16.87**	6.78**	-11.17**	11.03**	32.70**	18.12**
KS-8307×Azad B-2	-20.39**	-17.90**	37.17**	19.25**	-14.88**	-4.84**	-1.77**	8.45**	-7.12**	-4.94**	17.02**	7.37**
KS-8307×Azad B-4	4.53**	4.82**	16.44**	9.25**	-6.79**	-0.46	-6.35**	3.51**	-9.14**	0.76**	3.82*	3.55
KS-8307×Azad B-3	4.70**	-1.99**	7.89**	5.5**	-11.03**	3.71**	2.47**	15.15**	3.64**	17.11**	4.33**	3.74
KS-8307×Azad Kranti	6.02**	5.11**	-17.57**	-20.75**	2.28**	7.88**	5.07**	4.86**	6.07**	27.38**	3.23	5.94**
KS-5804×Azad B-2	-6.45**	-3.14**	36.49**	2.00**	-5.40**	-2.79**	-4.50**	-3.43**	13.31**	15.97**	-5.25**	-0.17
KS-5804×Azad B-4	3.53**	4.26**	58.16**	29.25**	0.10	-2.13**	-7.02**	-5.90**	-4.57**	5.70**	23.23**	2.50
KS-5804×Azad B-3	19.94**	12.78**	35.77**	16.25**	-12.18**	-5.54**	-13.65**	-11.00**	-24.37**	-14.45**	32.75**	10.01**
KS-5804×Azad Kranti	-7.28**	-7.67**	20.60**	1.25**	-0.62	-4.13**	13.35**	2.55**	3.96**	24.71**	33.00**	14.46**
KS-7871×Azad B-2	-2.83**	2.56**	22.55**	4.25**	-4.55**	0.50	-1.15**	5.90**	2.79**	5.32**	35.97**	20.74v
KS-7871×Azad B-4	5.12**	7.94**	22.00**	12.00**	5.29**	5.63**	-14.63**	-8.45**	-8.00**	1.90**	14.89**	5.26**
KS-7871×Azad B-3	8.58**	4.26**	16.96**	12.00**	0.16	10.30**	-20.54**	-13.32**	-20.45**	-9.89**	15.33**	5.31**
KS-7871×Azad Kranti	-3.78**	-2.28**	3.10**	-3.00**	4.27**	3.21**	-14.71**	-17.70**	-18.73**	-2.28**	26.87**	19.90**
KS-8312×Azad B-2	-13.78**	-8.81**	23.25**	17.00**	-2.69**	-4.59**	0.78*	7.26**	11.76**	20.53**	12.10**	9.01**
KS-8312×Azad B-4	1.66**	4.53**	14.11**	16.25**	25.78**	17.01**	-13.10**	-7.34**	-12.26**	1.90**	12.18**	3.55
KS-8312×Azad B-3	-0.44	-4.26**	7.87**	14.25**	9.12**	12.21**	-21.47**	-14.83**	-14.97**	0.76**	20.16**	10.54**
KS-8312×Azad Kranti	-15.92**	-14.49**	2.80**	7.00**	7.69**	-1.21	-0.53	-4.63**	-19.70**	0.76**	13.33**	7.87**
KS-8206×Azad B-2	11.60**	-9.10**	41.27**	16.25**	6.04**	4.21**	13.71**	-6.78**	7.83**	0.76**	7.42**	5.18*
KS-8206×Azad B-4	25.27**	-25.57**	16.82**	4.25**	0.86	-7.54**	12.05**	-4.86**	4.30**	12.93**	5.81**	1.86
KS-8206×Azad B-3	18.72**	-24.15**	8.72**	1.25**	4.30**	7.50**	16.99**	-8.69**	9.76**	8.37**	17.25**	12.53**
KS-8206×Azad Kranti	21.84**	-22.74**	32.57**	21.25**	7.17**	-1.42	15.33**	-17.46**	17.21**	5.32**	10.30**	9.37**
KS-7853×Azad B-2	5.88**	-6.82**	49.29**	31.25**	0.08	-5.50**	0.08**	4.07**	3.88**	1.90**	1.40**	0.46

KS-7853×Azad B-4	7.53**	-11.08**	20.44**	14.25**	13.21**	1.42	14.13**	-10.61**	17.68**	-5.70**	5.92**	-12.22**
KS-7853×Azad B-3	11.43**	-0.29	23.63**	22.00**	0.83	-1.46	7.17**	-1.67**	6.23**	9.51**	12.80**	4.89**
KS-7853×Azad Kranti	0.75	-4.26**	30.04**	26.25**	30.68**	15.34**	0.80	-7.42**	24.81**	-6.84**	7.72**	3.61
KS-6301×Azad B-2	9.82**	-13.93**	32.55**	17.00**	5.30**	-0.50	0.51	-0.64	24.40**	32.32**	8.29**	7.11**
KS-6301×Azad B-4	16.87**	-23.01**	30.42**	24.25**	15.67**	3.50**	10.67**	-11.56**	7.44**	23.57**	25.16**	15.85**
KS-6301×Azad B-3	4.13**	-17.62**	2.94**	21.25**	7.90**	7.13**	15.62**	-14.91**	6.49**	9.51**	16.10**	7.10**
KS-6301×Azad Kranti	6.52**	-2.56**	20.09**	17.00**	14.22**	0.75	21.20**	7.02**	18.88**	0.76**	9.78**	4.76*
No. of crosses with significant (+) heterosis	21	14	45	45	29	25	25	21	23	42	7.92**	5.95**
No. of crosses with significant (-) heterosis	23	31	3	3	10	10	20	25	25	6	41	29
Range of heterosis	-20.39+25.27	-25.57+16.19	-17.57+58.16	-20.75+34.25	-14.88+30.68	-7.54+17.01	-21.47+16.99	-17.70+15.15	-24.37+24.81	-14.45+32.32	-15.25+35.97	-12.22+30.19

Table 1: Cont.

Crosses	Number of fruits per cluster		Fruit length (cm)		Fruit circumference (cm)		Number of fruits per plant		Average fruit weight (g)		Specific gravity	
	Pooled		Pooled		Pooled		Pooled		Pooled		Pooled	
	MP	SV	MP	SV	MP	SV	MP	SV	MP	SV	MP	SV
KS-7570×Azad B-2	-10.71**	-3.85**	-21.01**	-45.26**	41.31**	113.26**	-21.01**	-45.26**	2.87*	-2.50	-7.11**	1.98**
KS-7570×Azad B-4	-5.52**	-1.54**	-35.40**	-54.90**	33.26**	117.61**	-35.40**	-54.90**	-9.07**	-27.21**	28.44**	42.57**
KS-7570×Azad B-3	-8.33**	-1.54**	9.14**	14.87**	6.36**	11.84**	9.14**	14.87**	-1.86	-14.06**	-17.14**	0.00
KS-7570×Azad kranti	0.61**	5.38**	6.32**	11.22**	35.09**	38.46**	6.32**	11.22**	31.10**	6.07**	-6.71**	0.00
KS-8204×Azad B-2	4.71**	13.85**	-29.83**	-48.47**	52.99**	133.40**	-29.83**	-48.47**	-33.10**	-41.55**	26.22**	20.79**
KS-8204×Azad B-4	-0.61**	5.38**	-40.04**	-55.66**	31.30**	116.60**	-40.04**	-55.66**	15.70**	28.25**	5.31**	1.98**
KS-8204×Azad B-3	-23.53**	-16.92**	-5.16**	3.70**	0.95**	7.79**	-5.16**	3.70**	-11.10**	-28.73**	-4.41**	1.98**
KS-8204×Azad Kranti	1.82**	7.69**	-3.77**	4.63**	7.69**	12.15**	-3.77**	4.63**	13.54**	-15.47**	7.09**	-0.99**
KS-7843×Azad B-2	2.89**	13.85**	12.59**	-18.52**	-27.76**	6.58**	12.59**	-18.52**	-29.78**	-26.31**	3.50**	-1.98**
KS-7843×Azad B-4	-2.38**	5.38**	-34.78**	-52.45**	38.53**	121.46**	-34.78**	-52.45**	-30.59**	-10.87**	4.42**	-0.99**
KS-7843×Azad B-3	-2.89**	7.69**	14.55**	24.02**	4.99**	6.88**	14.55**	24.02**	-40.10**	-41.47**	15.21**	20.79**
KS-7843×Azad Kranti	11.90**	20.77**	-11.25**	-4.41**	34.39**	33.20**	-11.25**	-4.41**	-44.37**	-48.82**	8.93**	0.00
KS-5803×Azad B-2	-1.20**	5.38**	-33.51**	-48.91**	54.34**	132.49**	-33.51**	-48.91**	15.67**	7.67**	19.34**	18.81**
KS-5803×Azad B-4	-4.35**	-1.54**	-28.19**	-44.39**	30.77**	113.26**	-28.19**	-44.39**	-19.90**	-6.65**	25.21**	25.74**
KS-5803×Azad B-3	-1.20**	5.38**	-20.13**	-9.91**	8.64**	13.97**	-20.13**	-9.91**	-33.21**	-42.65**	9.10**	20.79**
KS-5803×Azad Kranti	10.56**	13.85**	12.50**	26.20**	30.19**	33.10**	12.50**	26.20**	-2.24**	-21.64**	1.03**	-1.98**
KS-7811×Azad B-2	-11.35**	5.38**	-44.89**	-59.20**	41.14**	120.85**	-44.89**	-59.20**	-23.51**	-16.03**	0.12**	0.00
KS-7811×Azad B-4	-14.44**	-1.54**	27.81**	-4.68**	29.53**	19.03**	27.81**	-4.68**	-13.14**	15.74**	0.94**	1.98**
KS-7811×Azad B-3	-3.78**	13.85**	15.06**	26.53**	4.88**	16.09**	15.06**	26.53**	-45.39**	-43.99**	3.13**	13.86**
KS-7811×Azad Kranti	-8.89**	5.38**	-2.79**	6.26**	18.61**	28.14**	-2.79**	6.26**	-7.10**	-10.03**	3.21**	0.00
KS-8307×Azad B-2	-8.67**	1.54**	-18.27**	-39.71**	32.87**	105.26**	-18.27**	-39.71**	32.94**	29.50**	8.72**	20.79**
KS-8307×Azad B-4	-8.33**	-1.54**	-36.68**	-52.94**	29.65**	116.40**	-36.68**	-52.94**	19.43**	44.36**	-14.00**	-3.96**
KS-8307×Azad B-3	-10.98**	-1.54**	4.51**	14.65**	-7.20**	0.91**	4.51**	14.65**	19.78**	8.04**	-28.46**	-12.87**
KS-8307×Azad Kranti	-2.38**	5.38**	-11.73**	-3.70**	17.12**	24.29**	-11.73**	-3.70**	-43.88**	-52.59**	-12.97**	-5.94**
KS-5804×Azad B-2	-17.86**	26.92**	5.35**	-52.02**	6.96**	112.45**	5.35**	-52.02**	28.911**	28.57**	-2.44**	0.00
KS-5804×Azad B-4	0.61**	5.38**	16.81**	-46.13**	-8.06**	94.03**	16.81**	-46.13**	-31.21****	-15.24**	7.83**	10.89**
KS-5804×Azad B-3	-10.71**	-3.85**	23.53**	0.65	-27.82**	10.32**	23.53**	0.65	25.42	16.05**	-11.73**	0.00
KS-5804×Azad Kranti	6.75**	11.54**	41.72**	14.65**	-6.65**	3.04**	-6.65**	3.04**	-31.50**	-40.54**	0.27**	0.00

KS-7871×Azad B-2	3.80**	5.38**	8.97**	-50.22**	61.63**	69.68**	61.63**	69.68**	-23.95**	-15.84**	13.42**	10.89**
KS-7871×Azad B-4	4.58**	2.31**	18.31**	-45.37**	30.04**	36.94**	30.04**	36.94**	-57.73**	-43.30**	12.08**	9.90**
KS-7871×Azad B-3	-2.53**	-1.54**	-15.03**	-30.66**	-18.65**	-12.47**	-18.65**	-12.47**	35.73**	40.42**	3.59**	11.88**
KS-7871×Azad Kranti	7.19**	5.38**	28.36**	3.98**	6.41**	12.08**	6.41**	12.08**	-25.77**	-27.46**	5.48**	0.00
KS-8312×Azad B-2	-15.66**	-10.00**	4.71**	-53.65**	-17.84**	-17.15**	-17.84**	-17.15**	14.97**	-7.92**	18.27**	9.90**
KS-8312×Azad B-4	1.86**	5.38**	5.39**	-52.78**	37.36**	38.97**	37.36**	38.97**	-31.41**	-28.97**	18.64**	11.88**
KS-8312×Azad B-3	-21.69**	-16.92**	37.23**	10.08**	8.66**	12.47**	8.66**	12.47**	18.54**	-19.80**	-16.07**	-12.87**
KS-8312×Azad Kranti	1.86**	5.38**	54.27**	22.77**	-25.48**	-24.55**	-25.48**	-24.55**	74.98**	17.52**	22.04**	9.90**
KS-8206×Azad B-2	25.00**	-19.23**	1.63**	-52.89**	69.77**	33.05**	69.77**	33.05**	6.41**	-1.90	18.96**	18.81**
KS-8206×Azad B-4	6.75**	11.54**	30.53**	-38.73**	13.42**	-5.53**	13.42**	-5.53**	2.13	25.55**	2.10**	-0.99**
KS-8206×Azad B-3	10.71**	-3.85**	26.68**	-39.65**	24.89**	6.94**	24.89**	6.94**	47.47**	43.94**	2.18**	12.87**
KS-8206×Azad Kranti	**6.75****	11.54**	47.52**	20.53**	53.86**	28.22**	53.86**	28.22**	16.70**	-23.46**	17.68**	13.86**
KS-7853×Azad B-2	14.45**	26.92**	18.15**	-45.86**	1.02**	-5.53**	1.02**	-5.53**	39.30**	-38.52**	15.62**	-5.94**
KS-7853×Azad B-4	2.38**	5.38**	8.47**	-49.67**	53.32**	46.77**	53.32**	46.77**	21.34**	-1.88	11.36**	0.00
KS-7853×Azad B-3	13.29**	-3.85**	18.04**	-3.43**	0.26	-2.18**	0.26	-2.18**	35.73**	27.68**	27.85**	-11.88**
KS-7853×Azad Kranti	10.71**	-3.85**	17.12**	-4.96**	12.14**	7.40**	12.14**	7.40**	37.88**	-45.12**	11.28**	20.79**
KS-6301×Azad B-2	20.24**	29.23**	45.04**	-39.22**	5.23**	-3.20**	5.23**	-3.20**	11.47**	15.13**	6.13**	-0.99**
KS-6301×Azad B-4	6.75**	-2.31**	16.80**	-50.38**	29.06**	19.10**	29.06**	19.10**	23.49**	-19.77**	15.06**	22.77**
KS-6301×Azad B-3	8.33**	-1.54**	27.27**	-0.93**	16.27**	10.05**	16.27**	10.05**	72.63**	28.05**	14.27**	0.00
KS-6301×Azad Kranti	9.20**	13.85**	33.51**	3.10**	79.04**	65.39**	79.04**	65.39**	68.14**	15.10**	7.09**	9.90**
No. of crosses with significant (+) heterosis	25	30	31	15	36	32	36	32	24	17	38	24
No. of crosses with significant (-) heterosis	23	18	17	32	11	16	11	16	21	28	10	12
Range of heterosis	-23.53+25.00	-16.92+29.23	-44.89+54.27	-59.20+ 26.53	-34.10+79.04	-25.33+69.68	-34.10+79.04	-25.33+69.68	-57.73+74.98	-52.59+44.36	-28.46+28.44	-12.87+42.57

Table 1. Cont.

Crosses	**Dry matter content**		**Total soluble solid (TSS)**		**Fruit yield per plant(kg)**	
	Pooled		**Pooled**		**Pooled**	
	MP	**SV**	**MP**	**SV**	**MP**	**SV**
KS-7570×Azad B-2	19.64**	31.10**	4.30**	28.24**	65.65**	39.34**
KS-7570×Azad B-4	21.58**	30.31**	-25.36**	0.29*	-3.58**	1.90**
KS-7570×Azad B-3	21.67**	39.57**	-37.12**	-20.17**	-2.06**	-21.33**
KS-7570×Azad kranti	49.22**	42.91**	-2.52**	11.53**	24.33**	-9.48**
KS-8204×Azad B-2	14.38**	44.88**	5.46**	20.46**	-6.39**	-20.38**
KS-8204×Azad B-4	9.80**	36.61**	-11.07**	11.82**	53.10**	63.98**
KS-8204×Azad B-3	18.39**	56.10**	6.50**	25.94**	-4.05**	-21.80**
KS-8204×Azad Kranti	-6.41**	5.71**	-27.73**	-23.63**	27.36**	-5.69**
KS-7843×Azad B-2	12.53**	29.13**	-15.52**	-5.76**	-18.78**	-18.01**
KS-7843×Azad B-4	-15.83**	-5.51**	-37.11**	-22.77**	-15.78**	3.79**
KS-7843×Azad B-3	-31.28**	-17.72**	14.17**	31.70**	-55.78**	-56.87**
KS-7843×Azad Kranti	1.37**	2.17**	22.90**	26.22**	-36.25**	-42.65**
KS-5803×Azad B-2	-11.09**	2.56**	10.27**	26.22**	80.00**	45.50**
KS-5803×Azad B-4	23.58**	39.57**	4.00**	31.12**	17.07**	20.38**
KS-5803×Azad B-3	10.15**	32.68**	-11.16**	5.19**	-44.27**	-56.87**
KS-5803×Azad Kranti	15.19**	16.93**	-5.22**	0.29*	4.81**	-27.01**
KS-7811×Azad B-2	-0.07	19.69**	4.58**	31.70**	7.96**	2.84**
KS-7811×Azad B-4	-14.42**	0.39*	-3.85**	31.99**	-1.23**	15.64**

KS-7811×Azad B-3	-32.94**	-16.34**	-22.59**	0.29**	-50.16**	-54.50**
KS-7811×Azad Kranti	9.56**	15.94**	9.84**	28.82**	2.35**	-14.22**
KS-8307×Azad B-2	13.23**	15.16**	-4.61**	-0.58**	-9.97**	-6.64**
KS-8307×Azad B-4	2.61**	1.77**	-5.81**	8.93**	47.80**	85.78**
KS-8307×Azad B-3	21.72**	29.92**	-4.89**	2.88**	-2.36**	-2.37**
KS-8307×Azad Kranti	12.67**	-1.18**	32.16**	26.22**	-49.89**	-53.55**
KS-5804×Azad B-2	36.55**	38.78**	13.74**	29.11**	49.30**	55.45**
KS-5804×Azad B-4	26.66**	25.79**	-20.15**	0.00	-27.03**	-8.06**
KS-5804×Azad B-3	-7.04**	-0.79**	-12.47**	2.88**	80.98**	81.52**
KS-5804×Azad Kranti	36.15**	19.49**	30.3**	36.89**	-36.25**	-40.76**
KS-7871×Azad B-2	12.17**	25.79**	12.93**	25.94**	23.49**	38.39**
KS-7871×Azad B-4	-7.41**	1.57**	0.39**	23.34**	-42.58**	-23.22**
KS-7871×Azad B-3	15.01**	34.84**	-13.33**	0.00	10.27**	19.91**
KS-7871×Azad Kranti	-10.48**	-12.01**	-28.04**	-25.94**	-6.43**	-5.69**
KS-8312×Azad B-2	41.47**	56.69**	-15.06**	5.76**	-2.83**	-25.59**
KS-8312×Azad B-4	6.33**	15.16**	-43.82**	-23.63**	-0.32**	-1.90**
KS-8312×Azad B-3	-0.01	15.75**	-1.50**	-2.59**	29.65**	-5.69**
KS-8312×Azad Kranti	45.23**	40.75**	19.09**	37.75**	32.65**	-13.74**
KS-8206×Azad B-2	6.29**	6.50**	1.48**	28.24**	58.12**	35.07**
KS-8206×Azad B-4	16.24**	-6.69**	44.07**	-20.75**	7.92**	15.64**
KS-8206×Azad B-3	19.46**	-4.33**	19.35**	8.07**	82.82**	49.76**
KS-8206×Azad Kranti	2.37**	-2.56**	8.70**	10.95**	28.79**	-4.27**
KS-7853×Azad B-2	12.66**	25.79**	18.43**	37.46**	38.72**	-42.65**
KS-7853×Azad B-4	10.98**	-2.76**	24.29**	-3.46**	21.41**	40.28**
KS-7853×Azad B-3	9.53**	5.51**	17.03**	-0.58**	35.68**	21.80**
KS-7853×Azad Kranti	10.22**	7.68**	12.30**	20.46**	29.72**	-42.18**
KS-6301×Azad B-2	27.82**	33.27**	29.05**	-17.87**	47.36**	7.11**
KS-6301×Azad B-4	15.05**	17.13**	41.51**	-17.87**	1.99**	-7.11**
KS-6301×Azad B-3	22.34**	33.86**	44.98**	-34.29**	98.17**	36.97**
KS-6301×Azad Kranti	55.72**	40.75**	15.25**	-9.22**	98.65**	83.89**
No. of crosses with significant (+) heterosis	37	38	27	31	28	21
No. of crosses with significant (-) heterosis	9	10	21	15	20	27
Range of heterosis	-32.94+55.57	-17.72+56.69	-43.82+44.98	-34.25+37.75	-55.78+98.65	-56.87+85.78

Table 2: Table 2: Lists of crosses with desirable and significant heterosis for 15 characters in brinjal (Y1=2017-18 and Y2=2018-19) and pooled

Characters	Y_1		Y_2		Pooled	
	MP	SV	MP	SV	MP	SV
Days to 50% flowering	KS-8207 × Azad B-2 (-21.23%), KS-7843 × Azad B-4(-16.92), KS-7843 × Azad B-3 (-16.71%), KS-8312 × Azad kranti (-16.71%) and KS-5803 × Azad B-3 (-15.67%).	KS-8206 × Azad B-4 (-26.85%), KS-8206 × Azad B-3 (-25.13%), KS-6301 × Azad B-4 (-24.57%), KS-8206 × Azad Kranti (-23.42%) and KS-8307 × Azad B-2 (-19.42%).	KS-8307 × Azad B-2 (-19.57%), KS-7843 × Azad B-3 (-15.65), KS-8312 × Azad Kranti (-15.15%), KS-7843 × Azad B-4 (-14.29%) and KS-5803 × Azad B-3 (-13.89%).	KS-8206 × Azad B-4 (-24.29%), KS-8206 × Azad B-3 (-23.17%), KS-8206 × Azad Kranti (-22.03%), KS-6301 × Azad B-4 (-21.27%) and KS-8307 × Azad B-2 (-16.39%).	KS-8307 × Azad B-2 (-20.39%), KS-7843 × Azad B-3 (-16.17), KS-8312 × Azad Kranti (-15.92%), KS-7843 × Azad B-4 (-15.59%) and KS-5803 × Azad B-3 (-14.77%).	KS-8206 × Azad B-4 (-25.57%), KS-8206 × Azad B-3 (-24.15%), KS-6301 × Azad B-4 (-23.01%), KS-8206 × Azad Kranti (-22.74%) and KS-8307 × Azad B-2 (-17.19%).
Number of flowers per	KS-5804 × Azad B-4 (58.76%), KS-7853 × Azad B-2 (50.00%),	KS-7811 × Azad B-4 (35.62%), KS-7853 × Azad B-2 (32.32%),	KS-5804 × Azad B-4 (57.58%), KS-7853 × Azad B-2 (48.60%),	KS-7811 × Azad B-4 (32.68%), KS-7811 × Azad Kranti	KS-5804 × Azad B-4 (58.16%), KS-7853 × Azad B-	KS-7811 × Azad B-4 (34.25%), KS-7811 × Azad Kranti

influrencence	KS-5804 × Azad B-3 (43.75%), KS-8206 × Azad B-2 (40.82%) and KS-5803 × Azad B-2 (39.81%).	KS-7811 × Azad Kranti (32.32%), KS-5804 × Azad B-4 (30.53%) and KS-7853 × Azad Kranti (27.23%).	KS-5803 × Azad B-2 (42.18%), KS-8206 × Azad B-2 (41.71%) and KS-5804 × Azad B-2 (35.91%).	(30.22%), KS-7853 × Azad B-2 (30.22%), KS-5804 × Azad B-4 (27.76%) and KS-7853 × Azad Kranti (25.31%).	2 (49.29%), KS-8206 × Azad B-2 (41.27%), KS-8307 × Azad B-2 (37.17%) and KS-5804 × Azad B-2 (36.49%).	(31.25%), KS-7853 × Azad B-2 (31.25%), KS-5804 × Azad B-4 (29.25%) and KS-7853 × Azad Kranti (26.25%).
Leaf length (cm)	KS-7853 × Azad Kranti (34.00%), KS-8312 × Azad B-4 (29.34%), KS-5803 × Azad Kranti (25.49%), KS-7811 × Azad Kranti (23.65%) and KS-6301 × Azad B-4 (19.13%).	KS-8312 × Azad B-4 (20.28%), KS-7853 × Azad Kranti (18.74%), KS-8204 × Azad B-2 (17.36%), KS-7570 × Azad B-2 (17.19%) and KS-8312 × Azad B-3 (15.56%).	KS-7853 × Azad Kranti (27.52%), KS-7811 × Azad Kranti (22.85%), KS-8312 × Azad B-4 (22.44%), KS-5803 × Azad Kranti (19.45%) and KS-7570 × Azad B-4 (15.71%).	KS-8204 × Azad B-4 (15.18%), KS-7570 × Azad B-2 (14.82%), KS-8312 × Azad B-4 (13.97%), KS-7853 × Azad Kranti (12.19%) and KS-7570 × Azad B-4 (11.78%).	KS-7853 × Azad Kranti (30.68%), KS-8312 × Azad B-4 (25.78% ,KS-7811 × Azad Kranti (23.24%), KS-5803 × Azad Kranti (23.39%) and KS-6301 × Azad B-4 (15.67%).	KS-8312 × Azad B-4 (17.01%), KS-8204 × Azad B-2 (16.22%), KS-7570 × Azad B-2 (15.92%), KS-8206 × Azad B-3 (15.30%) and KS-7570 × Azad B-4 (12.55%).
Leaf width (cm)	KS-6301 × Azad Kranti (27.41%), KS-5804 × Azad Kranti (19.17%), KS-7811 × Azad Kranti (18.00%), KS-8206 × Azad B-3 (15.30%) and KS-6301 × Azad B-3 (13.79%).	KS-8307 × Azad B-3 (11.64%), KS-8312 × Azad B-2 (7.78%), KS-6301 × Azad Kranti (7.46%), KS-7871 × Azad B-2 (6.18%) and KS-8204 × Azad B-3 (4.57%).	KS-8206 × Azad Kranti (18.92%), KS-8206 × Azad B-3 (18.60%), KS-7853 × Azad B-4 (17.46%), KS-6301 × Azad B-3 (17.36%) and KS-8312 × Azad Kranti (16.96%).	KS-8307 × Azad B-3 (18.62%), KS-8307 × Azad B-2 (12.52%), KS-8204 × B-3 (12.44%), KS-7811 × Azad B-4 (12.12%) and KS-7811 × Azad Kranti (10.38%).	KS-8206 × Azad B-3 (16.99%), KS-7871 × Azad Kranti (16.87%), KS-6301 × Azad B-3 (15.62%), KS-8206 × Azad Kranti (15.33%) and KS-8206 × Azad B-2 (13.71%).	KS-8307 × Azad B-3 (15.15%), KS-8204 × Azad B-3 (8.53%), KS-8307 × Azad B-2 (8.45%), KS-7811 × Azad B-4 (8.29%) and KS-7843 × Azad B-4 (7.66%).
number of primary branches per plant	KS-7853 × Azad Kranti (24.21%), KS-6301 × Azad B-2 (23.81%), KS-6301 × Azad Kranti (19.59%), KS-8207 × Azad B-3 (19.54%) and KS-7811 × Azad B-4(17.65%).	KS-7843 × Azad B-3 (35.77%), KS-8307 × Azad B-3 (33.46%), KS-6301 × Azad B-2 (33.46%), KS-7811 × Azad B-3 (30.77%) and KS-7811 × Azad B-4 (28.08%).	KS-7853 × Azad Kranti (25.37%), KS-6301 × Azad B-2 (25.00%), KS-7853 × Azad B-4 (19.35%), KS-8206 × Azad Kranti (18.84%) and KS-6301 × Azad Kranti (18.18%).	KS-7843 × Azad Kranti (38.58%), KS-7811 × Azad Kranti (31.09%), KS-7570 × Azad Kranti (31.09%), KS-7811 × Azad B-3 (31.09%) and KS-8307 × Azad Kranti (31.09%).	KS-7853 × Azad Kranti (24.81%), KS-6301 × Azad B-2 (24.40%), KS-6301 × Azad Kranti (18.88%), KS-7853 × Azad B-4 (17.68%) and KS-8206 × Azad Kranti (17.21%).	KS-6301 × Azad B-2 (32.32%), KS-7811 × Azad B-3 (31.18%), KS-8307 × Azad Kranti (27.38%), KS-5804 × Azad Kranti (24.71%) and KS-7811 × Azad B-4 (24.33%).
Plant height (cm)	KS-5804 × Azad Kranti (36.39%), KS-5804 × Azad B-3 (33.88%), KS-5804× Azad B-4 (33.63%), KS-7811 × Azad B-3 (33.14%) and KS-7843 × Azad B-2 (16.15%).	KS-8204 × Azad Kranti (33.91%), KS-5804 × Azad Kranti (25.11%), KS-7871 × Azad B-3 (23.93%), KS-7811 × Azad B-3 (21.86%) and KS-6301 × Azad B-2 (19.81%).	KS-5804 × Azad Kranti (35.27%), KS-7811 × Azad B-3 (32.26%), KS-5804 × Azad B-3 (32.14%), KS-5804 × Azad B-4 (31.89%) and KS-8204 × Azad Kranti (26.31%).	KS-8204 × Azad Kranti (26.27%), KS-5804 × Azad Kranti (16.70%), KS-7871 × Azad B-3 (16.18%), KS-7811 × Azad B-3 (24.71%) and KS-6301 × Azad B-2 (12.19%).	KS-5804 × Azad Kranti (35.97%), KS-5804 × Azad B-3 (33.00%), KS-5804 × Azad B-4 (32.75%), KS-7811 × Azad B-3 (32.70%) and KS-7871 × Azad B-3 (26.87%).	KS-8204 × Azad Kranti (30.19%), KS-5804 × Azad Kranti (20.74%), KS-7871 × Azad B-3 (19.90%), KS-7811 × Azad B-3 (18.12%) and KS-6301 × Azad B-2 (15.85%).
Number of fruits per cluster	KS-8206 × Azad B-2 (28.57%), KS-6301 × Azad B-2 (19.05%), KS-6301 × Azad B-4 (17.07%), KS-7853 × Azad B-3 (16.28%) and KS-7853 × Azad Kranti (14.29%).	KS-6301 × Azad B-2 (39.17%), KS-7853 × Azad B-2 (33.33%), KS-5804 × Azad B-2 (33.33%), KS-7843 × Azad Kranti (27.50%) and KS-6301 × Azad Kranti (22.50%).	KS-8206 × Azad B-2 (21.43%), KS-6301 × Azad B-2 (21.43%), KS-5804 × Azad B-2 (21.43%), KS-7853 × Azad B-2 (17.24%) and KS-7843 × Azad Kranti (14.29%).	KS-6301 × Azad B-2 (20.13%), KS-7853 × Azad B-2 (20.13%), KS-5804 × Azad B-2 (20.13%), KS-7843 × Azad Kranti (13.42%) and KS-6301 × Azad Kranti (6.71%).	KS-8206 × Azad B-2 (25.00%), KS-6301 × Azad B-2 (20.24%), KS-7853 × Azad B-2 (14.45%), KS-7853 × Azad B-3 (13.29%) and KS-7843 × Azad Kranti (11.90%).	KS-6301 × Azad B-2 (29.23%), KS-7853 × Azad B-2 (26.92%), KS-5804 × Azad B-2 (26.92%), KS-7843 × Azad Kranti (20.77%) and KS-5803 × Azad Kranti (13.85%).
Fruit length (cm)	KS-8312 × Azad Kranti (57.96%), KS-8206 × Azad Kranti (47.75%), KS-6301 × Azad B-2 (45.11%), KS-5804 × Azad Kranti (43.03%) and KS-6301 × Azad Kranti (34.38%).	KS-5803 × Azad Kranti (26.18%), KS-7811 × Azad B-3 (25.47%), KS-8312× Azad Kranti (23.49%), KS-7843 × Azad B-3 (23.21%) and KS-8206 × Azad Kranti (20.79%).	KS-8312 × Azad Kranti (50.77%), KS-8206 × Azad Kranti (47.29%), KS-6301 × Azad B-2 (44.98%), KS-5804 × Azad Kranti (40.44%) and KS-8206 × Azad B-4 (36.95%).	KS-5803 × Azad Kranti (24.27%), KS-7843 × Azad B-3 (22.94%), KS-7811× Azad B-3 (20.29%), KS-8312 × Azad Kranti (20.18%) and KS-8207 × Azad B-3 (12.85%).	KS-8312 × Azad Kranti (54.27%), KS-8206 × Azad Kranti (47.52%), KS-6301 × Azad B-2 (45.04%), KS-5804 × Azad Kranti (41.72%) and KS-8312 × Azad B-3 (37.23%).	KS-7811 × Azad B-3 (26.53%), KS-5803 × Azad Kranti (26.20%), KS-7843× Azad B-3 (24.02%), KS-8312 × Azad Kranti (22.27%) and KS-8206 × Azad Kranti (20.53%).
Fruit	KS-5803 × Azad B-2 (53.93%),	KS-8312 × Azad B-2	KS-5803 × Azad B-2 (54.75%),	KS-6301 × Azad B-2 (132.30%),	KS-5803 × Azad B-2	KS-8312 × Azad B-2

circumference (cm)	KS-8204 × Azad B-2 (53.76%), KS-7811 × Azad B-2 (41.58%), KS-7570 × Azad B-2 (41.33%) and KS-7843 × Azad B-4 (34.38%).	(152.54%), KS-6301 × Azad B-2 (149.79%), KS-8204× Azad b-2 (142.07%), KS-7843 × Azad B-4 (130.34%) and KS-7811 × Azad B-2 (129.92%).	KS-8204 × Azad B-2 (52.25%), KS-7570 × Azad B-2 (41.29%), KS-7843 × Azad B-4 (38.17%) and KS-7570× Azad Kranti (35.39s).	KS-8204 × Azad B-2 (125.22%), KS-5803× Azad B-2 (124.54%), KS-7843 × Azad B-4 (113.19%) and KS-7811 × Azad B-2 (112.22%).	(54.34%), KS-8204 × Azad B-2 (52.99%), KS-7570 × Azad B-2 (41.31%), KS-7811 × Azad B-2 (41.14%) and KS-7843× Azad B-4 (38.53%).	(143.32%), KS-6301 × Azad B-2 (140.79%), KS-8204× Azad B-2 (133.40%), KS-5803 × Azad B-2 (132.49%) and KS-7843 × Azad B-4 (121.46%).
Number of fruits per plant	KS-6301 × Azad Kranti (77.21%), KS-8206 × Azad B-2 (70.25%), KS-7871 × Azad B-2 (61.50%), KS-5803 × Azad B-2 (56.08%) and KS-7570× Azad B-2 (49.13%).	KS-7871 × Azad B-2 (69.13%), KS-6301 × Azad Kranti (62.84%), KS-5804× Azad B-3 (60.80%), KS-7853 × Azad B-4 (46.66%) and KS-8206 × Azad B-2 (40.85%).	KS-6301 × Azad Kranti (80.83%), KS-8206 × Azad B-2 (69.30%), KS-7871 × Azad B-2 (61.76%), KS-5803 × Azad B-2 (54.59%) and KS-7853× Azad B-4 (53.23%).	KS-7871 × Azad B-2 (70.15%), KS-6301 × Azad Kranti (67.83%), KS-5804× Azad B-3 (62.41%), KS-8206 × Azad B-2 (40.76%) and KS-8312 × Azad B-4 (39.21%).	KS-6301 × Azad Kranti (79.04%), KS-8206 × Azad B-2 (69.77%), KS-7871 × Azad B-2 (61.63%), KS-5803 × Azad B-2 (55.33%) and KS-8206× Azad B-2 (53.86%).	KS-7871 × Azad B-2 (69.68%), KS-6301 × Azad Kranti (65.39%), KS-5804× Azad B-3 (61.57%), KS-7853 × Azad B-4 (46.77%) and KS-8312 × Azad B-4 (38.97%).
Average fruit weight (g)	KS-8312 × Azad Kranti (75.93%), KS-6301× Azad B-3 (73.66%), KS-6301 × Azad Kranti (61.50%), KS-8206 × Azad B-3 (48.01%) and KS-6301× Azad B-2 (42.31%).	KS-8307 × Azad B-4 (44.49%), KS-8206 × Azad B-3 (44.32%), KS-7871× Azad B-3 (40.66%), KS-8307 × Azad B-2 (29.67%) and KS-5804 × Azad B-2 (28.80%).	KS-8312 × Azad Kranti (74.04%), KS-6301× Azad B-3 (71.63%), KS-6301 × Azad Kranti (67.43%), KS-8206 × Azad B-3 (40.94%) and KS-6301× Azad B-2 (40.64%).	KS-8307 × Azad B-4 (44.36%), KS-8206 × Azad B-3 (43.68%), KS-7871× Azad B-3 (40.30%), KS-8307 × Azad B-2 (29.45%) and KS-5804 × Azad B-3 (28.47%).	KS-8312 × Azad Kranti (74.98%), KS-6301× Azad B-3 (72.63%), KS-6301 × Azad Kranti (68.14%), KS-8206 × Azad B-3 (47.47%) and KS-78× Azad B-2 (39.30%).	KS-8307 × Azad B-4 (44.36%), KS-8206 × Azad B-3 (43.94%), KS-7871× Azad B-3 (40.42%), KS-8307 × Azad B-2 (29.50%) and KS-8204 × Azad B-4 (28.25%).
Specific gravity	KS-7570 × Azad B-4 (28.43%), KS-7853× Azad B-3 (27.80%), KS-8204 × Azad B-2 (26.93%), KS-5803 × Azad B-4 (25.27%) and KS-8312× Azad Kranti (21.97%).	KS-7843 × Azad B-2 (96.04%), KS-7570 × Azad B-4 (42.57%), KS-5803× Azad B-3 (25.74%), KS-6301 × Azad B-4 (22.27%) and KS-7853× Azad Kranti (20.79%).	KS-7570 × Azad B-4 (28.46%), KS-7853× Azad B-3 (27.90%), KS-8204 × Azad B-2 (25.53%), KS-5803 × Azad B-4 (25.15%) and KS-8312× Azad Kranti (22.10%).	KS-7570 × Azad B-4 (44.00%), KS-5803 × Azad B-4 (27.00%), KS-6301× Azad B-4 (24.00%), KS-8307 × Azad B-2 (23.00%) and KS-7853× Azad Kranti (22.00%).	KS-7570 × Azad B-4 (28.44%), KS-7853× Azad B-3 (27.85%), KS-8204 × Azad B-2 (26.22%), KS-5803 × Azad B-4 (25.21%) and KS-8312× Azad Kranti (22.04%).	KS-7570 × Azad B-4 (42.57%), KS-5803 × Azad B-4 (25.74%), KS-6301× Azad B-4 (22.77%), KS-7853 × Azad Kranti (20.79%) and KS-8206× Azad Kranti (13.86%).
Dry matter content	KS-6301 × Azad Kranti (55.35%), KS-7570× Azad Kranti (49.36%), KS-8312 × Azad Kranti (45.41%), KS-5804 × Azad B-2 (37.14%) and KS-5804× Azad Kranti (36.74%).	KS-8204 × Azad B-3 (56.13%), KS-5804 × Azad B-2 (45.06%), KS-7570× Azad Kranti (43.08%), KS-8312 × Azad Kranti (40.71%) and KS-6301× Azad Kranti (40.71%).	KS-8312 × Azad B-2 (59.29%), KS-6301× Azad Kranti (56.09%), KS-7570 × Azad Kranti (49.08%), KS-8312 × Azad Kranti (45.05%) and KS-5804× Azad Kranti (35.56%).	KS-8312 × Azad B-2 (76.82%), KS-8204 × Azad B-3 (56.39%), KS-8204× Azad B-2 (45.19%), KS-7570 × Azad Kranti (43.22%) and KS-8312× Azad Kranti (40.47%).	KS-6301 × Azad Kranti (55.57%), KS-7570× Azad Kranti (49.22%), KS-8312 × Azad Kranti (45.23%), KS-8312 × Azad B-2 (41.47%) and KS-5804× Azad B-2 (36.55%).	KS-8312 × Azad B-2 (56.69%), KS-8204 × Azad B-3 (56.10%), KS-8204× Azad B-2 (44.88%), KS-7570 × Azad Kranti (42.91%) and KS-8312× Azad Kranti (40.75%).
Total soluble solids	KS-6301 × Azad B-3 (44.72%), KS-8206× Azad B-4 (44.71%), KS-6301 × Azad B-4 (41.44%), KS-8307 × Azad Kranti (32.99%) and KS-6301× Azad B-2 (29.71%).	KS-8312 × Azad Kranti (42.86%), KS-7843 × Azad B-2 (41.69%), KS-5804× Azad Kranti (40.80%), KS-7811 × Azad B-4 (37.03%) and KS-7843× Azad B-3 (35.86%).	KS-6301 × Azad B-3 (45.24%), KS-8206× Azad B-4 (43.43%), KS-6301 × Azad B-4 (41.57%), KS-5804 × Azad Kranti (31.51%) and KS-8307× Azad Kranti (31.34%).	KS-8312 × Azad Kranti (37.14%), KS-7843 × Azad B-2 (37.14%), KS-5804× Azad Kranti (37.14%), KS-7843 × Azad B-3 (31.43%) and KS-5803× Azad B-4 (31.43%).	KS-6301 × Azad B-3 (44.98%), KS-8206× Azad B-4 (44.07%), KS-6301 × Azad B-4 (41.51%), KS-8307 × Azad Kranti (32.16%) and KS-5804× Azad Kranti (30.30%).	KS-8312 × Azad Kranti (37.75%), KS-7843 × Azad B-2 (37.46%), KS-5804× Azad Kranti (36.89%), KS-7811 × Azad B-4 (31.99%) and KS-7843× Azad B-3 (31.70%).
Fruit yield per plant (kg)	KS-6301 × Azad B-3 (98.18%), KS-6301× Azad Kranti (98.09%), KS-8206 × Azad B-3 (83.92%), KS-5804 × Azad B-3 (82.03%) and KS-5803× Azad B-2 (79.71%).	KS-8307 × Azad B-4 (94.03%), KS-6301 × Azad Kranti (90.55%), KS-5804× Azad B-3 (89.55%), KS-5804 × Azad B-2 (62.19%) and KS-8206× Azad B-3 (55.72%).	KS-6301 × Azad Kranti (90.20%), KS-6301× Azad B-3 (98.17%), KS-8206 × Azad B-3 (81.77%), KS-5803 × Azad B-2 (80.29%) and KS-5804× Azad B-3 (79.95%).	KS-8307 × Azad B-4 (79.09%), KS-6301 × Azad Kranti (78.64%), KS-5804× Azad B-3 (75.45%), KS-5804 × Azad B-4 (59.55%) and KS-5804× Azad B-2 (50.00%).	KS-6301 × Azad Kranti (98.65%), KS-6301× Azad B-3 (98.17%), KS-8206 × Azad B-3 (82.82%), KS-5804 × Azad B-3 (80.98%) and KS-7570× Azad B-2 (65.65%).	KS-8307 × Azad B-4 (85.78%), KS-6301 × Azad Kranti (83.89%), KS-5804× Azad B-3 (81.52%), KS-8204 × Azad B-4 (63.98%) and KS-5804× Azad B-2 (55.45%).

References

1. Ansari SF, Mehta N, Sajid A, Gave JP. Variability studies in Brinjal (*Solanum melongena* L.) in Chhattisgarh plains. Electronic J Pl. Breed. 2011; 2(2):275-281.
2. Babu S, Thirumrugam J. Effect of heterosis in brinjal *(Solanum melongena* L.). J Ecotoxicology and Environmental Monitoring. 2000; 10(1):63-66.
3. Bavage MS, Madalageri MB, Mulge R. Hybrid performance in round fruited brinjal (*Solanum melongena* L.). Karnataka J Hort. 2005; 1(4):95-97.
4. Chadha S, Singh B, Kumar J. Heterosis in brinjal. Karnataka J Agri. Sci., 2001; 14(4):1130-1133.
5. Kanthaswamy V, Natarajan S, Srinivasan K, Ananthalakshmi A. Genetic studies in brinjal (*Solanum melongena* L.). South Indian Hort. 2003; 51(1-6):144-148.
6. Mohanty BK, Prusti AM. Response of brinjal hybrids in vertisols of Orissa. Orissa J Hort. 2003; 31(1):98-100.
7. Ram K, Singh P. Combining ability and gene effect for yield and quality characters in brinjal (*Solanum melongena* L.). Indian J Genetics and Pl. Breed. 2007, 67(1):93-94.
8. Ramireddy SRKM, Lingaiah HB, Naresh P, Reddy PVK, Kuchi VS. Heterosis studies for yield and yield attributing characters in brinjal (*Solanum melongena* L.).*Pl. Archives.*, 2011; 11(2):649-653.
9. Reddy EEP, Patel AL. Studies on gene action and combining ability for yield and other quantitative traits in brinjal (*Solanum melongena* L.). Trends in Bio. 2014; 7(5):381-383.
10. Shafeeq A, Madhusudan K, Hanchinal RR, Vijayakumar AG, Salimath PM. Heterosis in brinjal. Karnataka J. Agric. Sci. 2007; 20(1):33-40.
11. Vaddoria MA, Dobariya KL, Bhatiya VJ, Mehta DR. Hybrid vigour for earliness and plant stature in brinjal (*Solanum melongena* L.). Orissa J. Hort. 2007; 35(2):97-104.