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# To evaluate the performance of brinjal (*Solanum melongena*) on yield and its attributing characters Lakhisarai district in Bihar

**RK Verma, Rohit Maurya, Shivangi Singh, Vijay Kumar, Umesh Verma, RB Verma, SP Vishwakarma and Mahendra Pratap Singh**

**Abstract**
An On Farm Trial was carried out at 10 farmers' field of Lakhisarai district under supervision of KVK, Lakhisarai, BAU, Sabour (Bhagalpur) during kharif Season 2016 to the varietal trail of different cultivar of brinjal (Pusa hybrid 6 and Pusa hybrid -9) on the yield and its attributes. Three treatments viz. $T_1$- Farmers practice (use of private sector variety- Kiran), $T_2$- Pusa hybrid -9 and $T_3$- Pusa hybrid- 6 were arranged in Randomized Block Design with ten replications. The experimental result showed that the treatment $T_2$ (Pusa hybrid 9) displayed better response to almost all the growth and yield attributes except days to 50% flowering among all the treatments. The maximum yield of Pusa hybrid -9 (5.22 t/ha), net profit and B:C ratio (1: 2.8) was observed under the treatment $T_2$ (Pusa hybrid -9) however, the minimum values were noted in Farmer practice ($T_1$- Use of private sector variety- Kiran). Economically, highest net monitory return of Rs. 220741.6 per hectare was obtained by using Pusa hybrid -9 variety. Thus, the use of this variety was economical feasible and more convenient than other treatments.

**Keywords:** *Solanum melongena* L., brinjal, Pusa hybrid, yield, economics

## Introduction
Brinjal (*Solanum melongena* L.) belongs to family Solanaceae of Indo-Burma origin is most common vegetable crop of varying shape, size and color grown in India (Vavilov, 1928) [1]. The crop has a potential of self pollination and is generally known as egg plant because of its shape resembles from the egg (YH Hui, 2006; Rai *et al*., 1995) [3, 4]. It is moderate source of multivitamin such as phosphorous, calcium, iron and its nutritive value varies from variety to variety which can be compared with tomato (Choudhary, 1976) [2]. Immature fruits are used for dishes, pickle and other edible hygiene however when dry and mature fruits are used it can cause goiterogenic principle. Crops are grown throughout the year but the best suitable season for the growth is Rabi. Thus, the crop can be grown on a wide range of temperature. The optimum temperature for the growth of plant is 13-21 °C but the yield creases below 17 °C. Statistically, the production of brinjal coverages 733× $10^3$ mha and production 12510 × $10^3$ mT in 2016-17 in India but due to increase in the new high yielding varieties which have potential to achieve the similar productivity and quality in small area as if today. India is the second largest producer of brinjal after China which shares 27% of the total world production in 2014. Bihar ranks tenth position in the productivity of brinjal with coverage 19.75 mT/ha in 2015-16. Of Bihar Nalanda district is the top most cultivar of brinjal with production 149.99× $10^3$ mT in area 7.27× $10^3$ Ha (NBH, 2017-18). This crop is mostly favored by the small farmers because it is the cheap and best source of the cash income. Keeping the view in mind and considering the yield potential of brinjal in on as well as off season the study was conducted on the farmer's farms for varietal trail in the brinjal crop at proper sowing time to obtain the optimum yield.

## Material and Methods
The present investigation was carried out on ten farmers' field of different villages (Billauri) in Lakhisarai district under supervision of KVK, lakhisarai, BAU, Sabour (Bhagalpur), Bihar during Kharif season 2019-20. Krishi Vigyan Kendra, lakhisarai is situated at latitude of 25. $0260^0$ N and longitude of $86.0419^0$ E. The soil of experimental field was sandy to sandy loam in texture. All the three treatments like Pusa hybrid - 9 and pusa hybrid –6 farmers' practice (Private sector hybrid variety- Kiran) were arranged in randomized block design with ten

replications. The crop was transplanted at 90 cm x 45 cm. spacing. All the recommended cultural package of practices was adopted to raise a good crop. The observations on various growth and yield attributing traits like plant height (cm), days to first flowering, days to 50% flowering, fruit length (cm), fruit diameter (cm), fruit weight (gm), fruit per plant and Branches per plant and yield per hectare (t $ha^{-1}$). Were recorded on five randomly selected plants in each replication. The statistical analysis of data recorded on various aspects was computed by methods of analysis of variance and treatments were compared with the help of critical difference as suggested by Panse and Sukhatme (1989) [6] to draw the valid conclusion. The recommended dose of NPK fertilizers @ 200, 100 and 100 kg per hectare were applied to all treatments using Urea, DAP and MOP as a major source of nitrogen, phosphorous and potassium. Inspite of recommended dose of fertilizers, the well rotten cow dung @ 15 tons per hectare were also applied so as to maintain the physical condition of the soil (Rashid *et al.*, 1999) [5]. Proper care had been taken for irrigation, weeding and plant protection measure if found necessary. Irrigation was done one day before transplanting and then at a weekly interval. The whole experimental plots were kept free from any insecticide application if required the neem oil had been sprayed. For the eradication of weeds, weeding and hoeing were done after ten days interval.

## Results

**Table 1:** Description of the Treatments

| S. No. | Description of Treatments |
|---|---|
| T1 | Farmers practice- private sector hybrid brinjal variety (Kiran) |
| T2 | pusa hybrid 9 |
| T3 | pusa hybrid 6 |

**Table 2:** Effect of treatments on yield and its attributes

| | Plant Height (cm) | Days to first flowering | Days to 50% flowering | Fruit length (cm) | Fruit diameter (cm) | Fruit weight (gm) | Fruit per plant | Branches per plant | Yield (t/ha) |
|---|---|---|---|---|---|---|---|---|---|
| Private sector variety- Kiran | 74.3 | 57.18 | 77.89 | 10.54 | 8.31 | 209.67 | 7.21 | 5.42 | 2.85 |
| Pusa hybrid - 9 | 90.5 | 65.67 | 80.33 | 14.39 | 11.2 | 224 | 10.67 | 6.67 | 5.22 |
| Pusa hybrid - 6 | 84 | 60.67 | 79.33 | 12.54 | 10.43 | 213.54 | 9.54 | 6.73 | 3.9 |
| C.D. (p = 5%) | 4.031 | 5.176 | N.S. | 1.225 | 0.946 | 4.385 | 0.995 | 0.823 | 0.095 |
| SEM± | 1.346 | 1.729 | 0.743 | 0.409 | 0.316 | 1.464 | 0.332 | 0.275 | 0.032 |
| C.V. (p = 5%) | 5.133 | 8.937 | 2.968 | 10.357 | 10.008 | 2.147 | 11.501 | 13.861 | 2.511 |

N.S. is non-significant

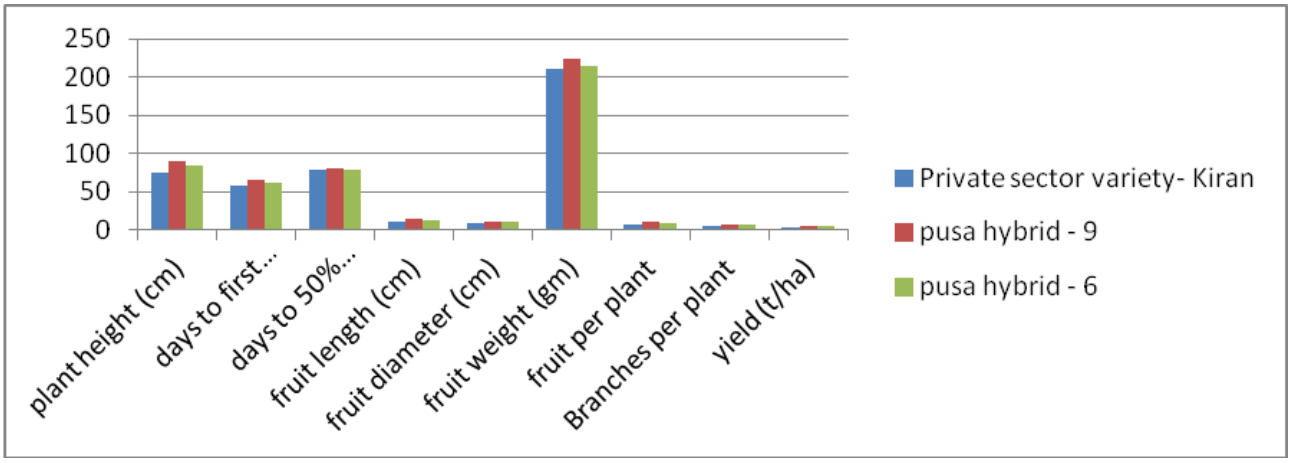


**Fig 1:** Performance of brinjal variety on yield and its attributes

**Table 3:** Description of Correlation Matrix

| | Plant Height (cm) | Days to first flowering | Days to 50% flowering | Fruit length (cm) | Fruit diameter (cm) | Fruit weight (gm) | Fruit per plant | Branches per plant | Yield t/ha |
|---|---|---|---|---|---|---|---|---|---|
| Plant Height (cm) | 1 | | | | | | | | |
| days to first flowering | 0.39* | 1 | | | | | | | |
| days to 50% flowering | 0.05 | 0.5* | 1 | | | | | | |
| fruit length (cm) | 0.34 | 0.57* | 0.85* | 1 | | | | | |
| fruit diameter (cm) | 0.27 | 0.61* | 0.81* | 0.88* | 1 | | | | |
| fruit weight (gm) | 0.24 | 0.5* | 0.79* | 0.82* | 0.74* | 1 | | | |
| fruit per plant | 0.43* | 0.65* | 0.63* | 0.83* | 0.84* | 0.73* | 1 | | |
| Branches per plant | 0.19 | 0.48* | 0.76* | 0.76* | 0.84* | 0.85* | 0.75* | 1 | |
| Yield t/ha | 0.82* | 0.43* | 0.11 | 0.42* | 0.36 | 0.42* | 0.58* | 0.24 | 1 |

**Table 4:** Economics of Brinjal

| Treatments | Gross cost (Rs/ha) | Gross return (Rs/ha) | Net return (Rs/ha) | B:C |
|---|---|---|---|---|
| Local brinjal variety | 122458.4 | 188100 | 65641.6 | 1.53 |
| pusa hybrid 9 | 122458.4 | 343200 | 220741.6 | 2.8 |
| pusa hybrid 6 | 122458.4 | 257400 | 134941.6 | 2.1 |

## Discussion

Variety pusa hybrid 9 in this experiment had been found to give best result in comparison to other treatment. Plant height (cm), days to first flowering, days to 50% flowering, fruit length (cm), fruit diameter (cm), fruit weight (gm), fruit per plant and Branches per plant under this experiment gives highest outcome. All these attributing character under this experiment were found to give significant changes except days to 50% flowering which was non-significant. Statistically, these characters under this experiment found to be 90.5 cm, 65.67, 80.33, 14.39 cm, 11.2 cm, 224 gm, 10.67 and 6.67 with C.D. 4.031 cm, 5.176, 1.225 cm, 0.946 cm, 4.385 gm, 0.995 and 0.823 respectively. The SEM± for the yield attributing character was 1.346 cm, 1.729, 0.743, 0.409 cm, 0.316 cm, 1.464 gm, 0.332 and 0.275.

Yield is the most promising character which was to be calculated in this experiment. The productivity of the fruit yield was influenced by using pusa hybrid 9 cultivar which was 5.22 t/ha and was found to be positively correlated with all yield attributing character. It is significantly correlated with plant height (cm), days to first flowering, fruit length (cm), fruit weight (gm) and fruit per plant with r = 0.82, 0.43, 0.36, 0.42 and 0.58 however non-significantly correlated with days to 50% flowering (r=0.11), fruit diameter (cm) (r= 0.42) and Branches per plant (r= 0.24).

Economically, highest net monitory return of Rs. 220741.6 per hectare with B:C ratio 2.8:1 was obtained in second treated plots i.e. use of pusa hybrid 9 cultivar as compared to the other treatments. The experiment requires the fixed cost of Rs. 122458.4 per hectare. The economics under this experiment were well tabulated in table 4.

## Conclusion

The finding from the experimental varietal trail of brinjal in Rabi 2016-17 at farmers field under the jurisdiction of KVK of district lakhisarai invokes that use of pusa hybrid 9 cultivar had remarkable effect on the yield and its attributes for brinjal fruits. Thus, the recommendation of this variety would be suitable recommendation at district lakhisarai, Bihar.

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