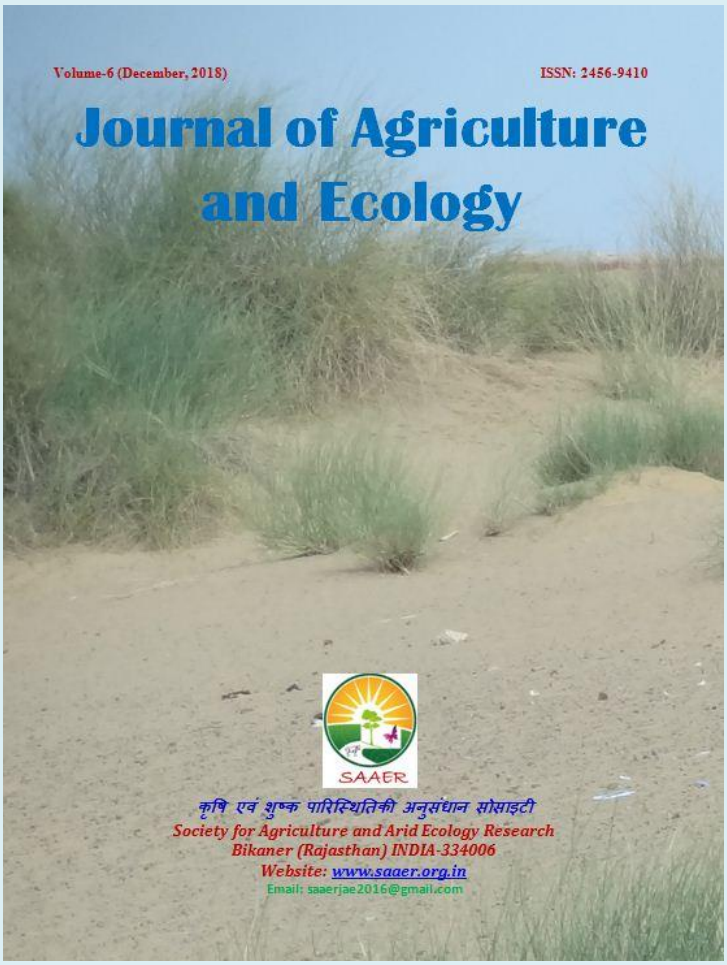
# Mean performance of brinjal (*Solanum melongena* L.) genotypes under Tamil Nadu condition

**DA Akshay, S Praneetha, P Irene Vethamoni & S Rajeswari**




**Journal of Agriculture and Ecology**

ISSN: 2456-9410
Volume: 6

*Journal of Agriculture and Ecology (2018) 6: 47-53*
http://doi.org/10.53911/JAE.2018.6206

Journal of Agriculture and Ecology, 2018, Vol.6, 47-53
http://saaer.org.in

Research Article Open Access

# Mean performance of brinjal (Solanum melongena L.) genotypes under Tamil Nadu condition

DA Akshay[1], S Praneetha[2], P Irene Vethamoni[3]& S Rajeswari[4]
[1] *Department of vegetable crops, Tamil Nadu Agricultural University, Coimbatore*
[2] *Horticultural Research Station, Yercaud, Tamil Nadu, India*
[3] *RVS Padmavati College of Horticulture, Sempatti, Dindugal*
[4] *Centers for Plant Breeding and Genetics, Tamil Nadu Agricultural University, Coimbatore*
*Corresponding author: DA Akshay, E-mail:* daakshay@gmail.com

**Article Info**

*Article history*
Received: 20 August 2018
Accepted: 26 August 2018
Available online: 27 November 2018

**Key Words:** Genotype, brinjal, yield, mean.

**Abstract**

Thirteen genotypes of brinjal were collected from various places of Tamil Nadu and other states and evaluated during September 2017- January 2018. Among these, the plant height of the genotypes ranged between 72.93cm (Utkal Anushree) to 95.84 cm (Bhavani Gold), Number of branches was found be highest in IC 3749281 (7.75), ABSR 2 recorded the least number of days to first flowering (43.15 days), Karur Local showed the least value of 64.46 days for days to first harvest among the genotypes, Thevur Local recorded the maximum fruit length of 12.95 cm, Mattu Gulla showed the highest value of fruit girth (17.44 cm) and individual fruit weight (88.67 g). The maximum number of fruits was recorded in ABSR 2 (39.75), the shoot borer infestation was found to least in IC 374928-1 (11.28 %) and least value for fruit borer infestation was observed in Karur Local (14.16 %) and ABSR 2 (14.87 %). Among the genotypes evaluated, the highest marketable yield was recorded in Karur Local (2.60 kg) followed by Bhavani Gold (2.15 kg).



Preferred citation: Akshay DA, Praneetha S, Vethamoni PI & Rajeswari S. 2018. Mean performance of brinjal (Solanum melongena L.) genotypes under Tamil Nadu condition. *Journal of Agriculture and Ecology*, 6: 47-53; http://doi.org/10.53911/JAE.2018.6206.

## Introduction

Brinjal (*Solanum melongena* L.) is one of the most popular vegetable crops of tropical and sub-tropical region belonging to the family Solanaceae. It is also known as egg plant, aubergine or guinea squash. India is the centre of origin of brinjal (Zeven & Zhukovsky 1975) and the cultivation of this crop began from the time immemorial, so this crop is an inseparable part of the Indian diet. Therefore, it is cultivated extensively throughout the year, in all parts of India except at higher altitudes. Brinjal is one of the highly valued vegetable for its various

nutritional and pharmaceutical values. The brinjal fruits consist of 92.6% of water, 6.14% of carbohydrates, 0.7% of protein and 3.6% of dietary fibres (Nino-Medina et al. 2014). It contains minerals like calcium (0.02%), phosphorus (0.02%), iron (0.0013%) and other mineral matters and vitamins like β -carotene (34 mg), riboflavin (0.05 mg), thiamine (0.05 mg), niacin (0.5 mg) and ascorbic acid (0.9 mg) per 100 g of fruit (Kandoliya *et al*., 2015). It has several ayurvedic medicinal properties. It is good for diabetic patients and has been recommended as an excellent remedy for those suffering from liver complaints (Shukla & Naik 1993; Samadia & Haldhar 2017).

The significant countries cultivating brinjal around the world are India, Bangladesh, China, Pakistan, Nepal, U.S.A, Sri Lanka, Cyprus, Egypt, Japan, Philippines, Syria and other tropical countries. In India, the major brinjal producing states are West Bengal, Orissa, Bihar, Karnataka, Andhra Pradesh, Maharashtra, Uttar Pradesh and Tamil Nadu. In Tamil Nadu, brinjal crop is raised during rainy season as well as in summer to meet out the market demands throughout the year. It is grown in almost all the districts and extensively in Coimbatore, Dindigul, Salem, Cuddalore, Kancheepuram, Madurai, Namakkal, Thirunelveli, Thiruvallur, Tiruvannamalai and Erode districts. The productivity of brinjal is low in India (19.1 MT/ha) compared to world productivity (26.7 MT/ha) (Anonymous 2015) due to the use of low yielding cultivars grown for local preferences, non-adoption of good management practices and the problems of diseases and pests. To overcome these problems, the breeding programmes involving local types of brinjal should be emphasized. The present study aims on evaluation of the brinjal genotypes from different regions for growth and yield characters.

## Material and Methods

The present investigations was carried out at the Department of Vegetable crops, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore which is situated at 11° N latitude and 77° E longitude and at an elevation of 426.6 m above mean sea level. The experimental design was Randomized Block Design with three replications. The genotypes used in the study were selected based on the preference of brinjal type in the western districts of Tamil Nadu. The seedlings were raised in protrays containing cocopeat enriched with *Azospirillum* and *Phosphobacteria*. Seeds were treated with *Trichoderma viride* to protect the seeds from pathogenic infection and shade dried. The transplanting was carried out with 28 days old healthy seedlings. All other standard packages of practices and plant protection measures were adopted uniformly. Observations were recorded on the growth and yield characters like plant height, number of branches per plant, days to first flowering, days to first harvest, fruit length, fruit girth, fruit weight, number of fruits per plant, fruit yield per plant, shoot borer infestation, fruit borer infestation and marketable yield per plant in all the genotypes of brinjal. The collected data was subjected to statistical analysis.

**The brinjal genotypes selected for evaluation**

| S. No. | Genotype | Source |
|---|---|---|
| 1. | Kangayampalayam Local | Tirupur District. Tamil Nadu(TN) |
| 2. | Bhavani Gold | Erode District.TN |
| 3. | KannadiKathri | Bhavanisagar, Erode District. TN |
| 4. | Cuddalore Local | Cuddalore District. TN |
| 5. | Tevur Local | Salem, District. TN |
| 6. | UtkalAnushree | OUA&T, Odisha |
| 7. | Karur Local | Karur District. TN |
| 8. | OdavaiPachai | Dindigul District. TN |
| 9. | Namakkal Local | Namakkal District. TN |
| 10. | ABSR – 2 | NBPGR, New Delhi |
| 11. | IC 374928 – 1 | NBPGR, New Delhi |
| 12. | MattuGulla | Udupi District, Karnataka |
| 13. | Manapparai Local | Trichy District, Tamil Nadu |

## Results and Discussion

The complete breeding study must be start with selection. In this concern here, thirteen genotypes were evaluated for twelve characters for selecting superior genotypes. The ANOVA for the observed traits were found to be significant so the traits can be taken under consideration for the selection programme (Table 1). In this experiment, the plant height of the genotypes ranged between 72.93cm (Utkal Anushree) to 109.16 cm (Bhavani Gold). Similar findings were reported by Sivakumar et al. (2016) and Kannan et al. (2017). Number of branches was highest in ABSR 2 (8.15), while the lowest was recorded by Thevur Local (5.14) (Table 2). This was in accordance with the results of Vidhya & Kumar (2015) and Reshmika et al. (2015). The genotype Namakkal local recorded the least number of days to first flowering (44.36 days) and Bhavani Gold recorded more number of days (52.76) to bloom first flower. Similar results for earliness in flowering were reported by Kamal et al. (2013), Kumar & Arumugam (2013), Kumar et al. (2013) and Reshmika et al. (2015). Days to first harvest was ranged from 65.64 to 73.29 days with Karur Local showing the least value of 65.64 days (Table 2). Similar results were cited by Suresh et al. (2012) and Nirmala et al. (2013).

**Table 1.** Analysis of variance for growth and yield characters

| S. No. | Characters | Replication | Treatment | Error |
|---|---|---|---|---|
| | | (df = 2) | (df = 12) | (df = 24) |
| 1 | Plant height (cm) | 7.5 | 275.33** | 35.01 |
| 2 | Number of branches per plant | 0.06 | 2.84** | 0.18 |
| 3 | Days to first flowering | 10.91 | 26.17* | 11.26 |
| 4 | Days to first harvest | 8.96 | 45.61* | 17.95 |

| | | | | |
|---|---|---|---|---|
| 5 | Fruit length (cm) | 1.83 | 22.41** | 1.49 |
| 6 | Fruit girth (cm) | 1.33 | 22.41** | 1.07 |
| 7 | Fruit weight (g) | 18.89 | 554.69** | 28.8 |
| 8 | Number of fruits per plant | 3.15 | 38.89** | 5.35 |
| 9 | Fruit yield per plant (kg) | 0.03 | 0.32** | 0.01 |
| 10 | Shoot borer infestation (%) | 0.51 | 3.63** | 0.79 |
| 11 | Fruit borer infestation (%) | 0.03 | 12.44** | 0.68 |
| 12 | Marketable yield per plant (kg) | 0.005 | 0.27** | 0.01 |

** Significance at 1 per cent level * Significance at 5 per cent level

The mean fruit length was found to be highest in Karur Local (13.04 cm) and lowest in Odavai Pachai (8.39 cm). Mattu Gulla (18.74 cm) was found to have the highest value of fruit girth among the genotypes and the range was between 11.43 cm to 18.74 cm. The individual fruit weight was found to be highest in Mattu Gulla (87.89 g) followed by Manapparai Local (85.99 g) and Utkal Anushree recorded the minimum fruit weight of 43.50 g (Table 2). These findings are in agreement with the results obtained by Kamal et al. (2013), Kannan et al. (2017) and Pujer et al. (2017). The maximum number of fruits per plant was recorded in ABSR 2 (39.75) followed by Karur Local (39.33). Manapparai Local (28.78) recorded minimum number of fruits per plant. These results are in confirmation with Kamal et al. (2013), Kumar & Arumugam (2013), Nirmala et al. (2013), Solaimana et al. (2015), Kannan et al. (2017) and Pujer et al. (2017). Karur Local (2.88 kg) was found to have the highest yield per plant among the genotypes followed by Bhavani Gold (2.45 kg) and Thevur Local (1.65 kg) was showing the least value (Table 2). These findings are in agreement with the results obtained by Praneetha et al. (2002), Nirmala et al. (2013), Vidhya & Kumar (2015) and Akpan et al. (2016) and Kannan et al. (2017).

The shoot borer infestation was found to least in IC 374928 - 1 (11.28 %) and Odavai Pachai (14.81 %) showed the highest value.The least value for fruit borer infestation was observed in Karur Local (14.16 %) and ABSR 2 (14.87 %). Among the genotypes, Manapparai local (21.15 %) showed the maximum infestation of fruit borer. Similar results were cited by Nirmala et al. (2013), Praneetha et al. (2013), and Vidhya & Kumar (2015). Among the genotypes evaluated, the highest marketable yield was recorded in Karur Local (2.95 kg) followed by Bhavani Gold (2.15 kg). The lowest marketable yield was recorded by Thevur Local with the value of 1.43 kg (Table 2). Similar results were recorded by Nirmala et al. (2013) and Vidhya & Kumar (2015). Among the thirteen genotypes evaluated, Karur Local was found to be the best genotype with highest marketable yield with least fruit borer infestation and other yield contributing characters followed by Bhavani Gold. The stability of the above genotypes can be assessed and these genotypes can be used for further breeding programme for improvement.

**Table 2.** Mean performance of brinjal genotypes for growth and yield parameters

| Cultivar | PH (cm) | NOB | DFF | DFH | FL (cm) | FG (cm) | FW (g) | NOF | FYP (kg) | SI (%) | FI (%) | MYP (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kangayampalayam local | 84.48 | 5.2 | 48.18 | 68.81 | 9.2 | 16.53 | 62.42 | 33.75 | 2.09 | 12.32 | 19.69 | 1.74 |
| Karur local | 80.62 | 7.67 | 48.49 | 65.64 | 13.04 | 13.13 | 66.44 | 39.33 | 2.88 | 11.69 | 14.16 | 2.6 |
| Kannadi Kathiri | 88.63 | 6.13 | 52.49 | 72.37 | 12.89 | 11.43 | 60.07 | 38.62 | 2.31 | 11.42 | 18.78 | 1.93 |
| Thevur local | 84.62 | 5.14 | 45.84 | 73.29 | 12.6 | 12.49 | 54.65 | 31.01 | 1.65 | 12.48 | 16.08 | 1.43 |
| Bhavani Gold | 109.16 | 7.08 | 52.76 | 72.66 | 9.46 | 16.91 | 61.71 | 37.55 | 2.45 | 11.72 | 17.64 | 2.15 |
| Manapparai local | 99.06 | 7.11 | 49.19 | 71.82 | 10.1 | 18.35 | 85.99 | 29.67 | 2.4 | 14.39 | 21.15 | 1.98 |
| Cuddalore local | 86.82 | 5.6 | 47.38 | 69.78 | 11.31 | 15.37 | 67.06 | 36.99 | 2.28 | 12.44 | 16.47 | 1.96 |
| Odavai Pachai | 79.93 | 6.55 | 48.43 | 72.93 | 8.39 | 10.63 | 61.33 | 30.85 | 1.82 | 14.81 | 18.08 | 1.5 |
| Namakkal local | 93.49 | 6.57 | 44.36 | 69.27 | 10.17 | 12.09 | 60.13 | 37.36 | 2.01 | 12.21 | 17.06 | 1.74 |
| Mattu Gulla | 91.83 | 5.59 | 52.25 | 72.98 | 12.38 | 18.74 | 87.89 | 31.49 | 2.34 | 12.68 | 20.05 | 2.05 |
| ABSR 2 | 83.39 | 8.15 | 48.24 | 66.2 | 10.45 | 12.2 | 40.93 | 39.75 | 1.95 | 11.32 | 14.87 | 1.83 |
| Utkal Anushree | 73.69 | 7.06 | 46.85 | 70.86 | 8.73 | 13.31 | 44.37 | 38.39 | 1.87 | 11.86 | 17.31 | 1.68 |
| IC 374928-1 | 76.8 | 7.5 | 49.23 | 71.88 | 11.49 | 16.35 | 51.47 | 35.06 | 1.95 | 11.28 | 19.06 | 1.76 |
| Mean | 87.12 | 6.57 | 48.75 | 70.65 | 10.79 | 14.43 | 61.88 | 35.37 | 2.15 | 12.36 | 17.72 | 1.87 |
| SEd | 4.83 | 0.35 | 2.74 | 3.46 | 0.68 | 1.00 | 4.38 | 1.89 | 0.10 | 0.73 | 0.68 | 0.08 |
| CD (0.05) | 9.97 | 0.73 | 5.66 | 7.14 | 1.41 | 2.06 | 9.04 | 3.90 | 0.20 | 1.50 | 1.40 | 0.17 |

PH - Plant height
NOB - Number of branches plant$^{-1}$
DFF - Days to first flowering
DFH - Days to first harvest
FL - Fruit length
FG - Fruit girth
FW - Fruit weight
NOF - Number of fruits plant$^{-1}$
FYP - Fruit yield plant$^{-1}$
MYP - Marketable yield plant$^{-1}$
SI - Shoot borer infestation
FI - Fruit borer infestation

## References

Akpan NM, Ogbonna P, Onyia V, Okechukwu E, Atugwu A & Dominic IO. 2016. Studies on the Variability and Combining Ability for Improved Growth and Yield of Local Eggplant Genotypes (Solanum melongena L.). *Notulae Scientia Biologicae*, 8(2): 226-231.

Anonymous. 2017. Horticultural Statistics at a Glance. National Horticultural Board, Government of India

Kamal K, Singh KP, Singh VK & Ashish R. 2013. Varietal performance of round fruited F1 hybrid of egg plant (Solanum

melongena L.) in east Bihar. *Asian Journal of Horticulture*, 8 (1): 383-384.

Kandoliya UK, Bajaniya VK, Bhadja NK, Bodar NP & Golakiya BA. 2015. Antioxidant and nutritional components of eggplant (Solanum melongena L.) fruit grown in Saurastra region. *Journal of Current Microbiology Applied Science*, 4: 806-813.

Kannan D, Singh DK & Jain SK. 2017. Genetic Variability, Heritability, Genetic Advance of Yield Related Characters in SAAG. *Vegetos*, 4: 20.

Kumar SR & Arumugam T. 2013. Phenotypic evaluation of indigenous Brinjal types suitable for rainfed conditions of South India (Tamil Nadu). *African Journal of Biotechnology*, 12(27).

Kumar SR, Arumugam T, An CR & Premalakshmi V. 2013. Genetic variability for quantitative and qualitative characters in Brinjal (*Solanum melongena* L.). *African Journal of Agricultural Research*, 8(39): 4956-4959.

Niño-Medina G, Urias-Orona V, Muy-Rangel M, & Heredia J. 2017. Structure and content of phenolics in eggplant (*Solanum melongena*)-a review. *South African Journal of Botany*, 111: 161-169.

Nirmala N, Praneetha S & Manivannan N. 2013. Per se performance of cluster bearing, glossy purple brinjal (*Solanum melongena* L.) hybrids for economic traits. *Electronic Journal of Plant Breeding*, 4(2): 1188-1192.

Praneetha S, Sarasvathy T, Veeraragavathatham D & Pugalendhi L. 2013. Research Article Per se performance and heterosis for shoot and fruit borer (Leucinodes orbonalis Gn) resistance and yeild in brinjal (*Solanum melongena* L.). *Electronic Journal of Plant Breeding*, 4(1): 1061-1066.

Praneetha S. 2002. Breeding for shoot and fruit borer (Leucinodes orbonalis G.) resistance in brinjal (*Solanum melongena* L.). PhD Thesis, Tamil Nadu Agricultural University, Coimbatore.

Pujer P, Jagadeesha RC & Cholin S. 2017. Genetic variability, Heritability and Genetic Advance for Yield, Yield Related Components of Brinjal (*Solanum melongena* L.) Genotypes. *International Journal of Pure Applied Bioscience*, 5(5): 872-878.

Reshmika PK, Gasti VD, Evoor S, Jayappa J & Mulge R. 2015. Genetic variability studies for growth, earliness, yield and quality parameters in brinjal (*Solanum melongena* L.). *Environment and Ecology*, 33(2): 761-766.

Samadia DK & Haldhar SM. 2017. Breeding strategies and scope of improvement in arid zone fruit crop-plants under abiotic stressed agro-climate: an analysis. *Journal of Agriculture and Ecology*, 4: 1-13.

Shukla V & Naik LB. 1993. Agro-techniques of solanaceous vegetables, in 'Advances in Horticulture', Vol. 5, Vegetable Crops, Part 1 (KL Chadha & G. Kalloo, eds.), Malhotra Pub. House, New Delhi, 365.

Sivakumar V, Jyothi KU, Venkataramana C, Paratparao MRR & Umakrishna K. 2016. Performance of brinjal (Solanum melongena L.) parents and hybrids for yield and yield attributing characters under high altitude region of Andhra Pradesh. *Electronic Journal of Plant Breeding*, 7(2): 438-442.

Solaimana AHM, Nishizawa T, Khatuna M & Ahmad S. 2015. Physio-morphological characterization genetic variability and correlation studies in brinjal genotypes of Bangladesh. *Computational and Mathematical Biology*, 4(1): 1-36.

Suresh KP, Singh TH, Sadashiva AT & Reddy KM. 2012. Performance of parents and hybrids for yield and yield attributing characters in manjarigota type of brinjal (Solanum melongena L.). *Madras Agricultural Journal*, 99(7-9): 181-184.

Vidhya C & Kumar N. 2015. Genetic variability studies in Brinjal (Solanum melongena) for fruit yield and quality. *Electronic Journal of Plant Breeding*, 6(3): 668-671.