

Original Research Article

Evaluation of F₁ Progenies of Brinjal (*Solanum melongena* L.) for Yield and Yield Attributing Characters under Konkan Agro-climatic Conditions

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ABSTRACT

The field experiment entitled “Evaluation of F₁ Progenies of Brinjal (*Solanum melongena* L.) for Yield and Yield Attributing Characters Under Konkan Agro-climatic Conditions” was conducted at Vegetable Improvement Scheme, Central Experiment Station, Wakawali, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri (M.S.) during Rabi season of the year 2017-18. The experiment was laid out in Randomized Block Design with twenty treatments and two replication. Out of which treatment T₁₅ (DPL Br-14 × DPL Br-13) recorded minimum number of days for first harvest (71.10 Days After Transplanting). Treatment T₁₇ (DPL Br-18 × DPL Br-3) reported maximum number of pickings (8.50), maximum number of fruits per plant (23.29), maximum yield per plot (14.44 kg) and maximum yield per hectare (207.55 q/ha). Also longest length fruit (15.26 cm) was reported in treatment T₁₇ (DPL Br-18 × DPL Br-3).

Keywords

Brinjal (*Solanum melongena* L.), F₁ progenies, Yield attributing characters, Randomized Block Design (RBD)

Introduction

Brinjal (*Solanum melongena* L.) belongs to the family Solanaceae with diploid chromosome number 2n = 24. Owing to its highest production potential it is also termed as poor man’s vegetable. Area under the brinjal cultivation in India is 662.5 lakh ha with production of 12515.19 Thousand MT and productivity of 18.7 MT/ha (Anon., 2017). In Maharashtra, area under brinjal crop is 22.14 thousand hectare with 433.08 thousand MT annual production (Anon., 2017).

Due to variations in consumer’s preference for colour, shape and size, it is not possible to recommend one common cultivar to suit demands of different localities. It is therefore, essential to improve locally preferred cultivars with high yield potential and adaptability or development of new hybrid combinations from local cultivars through required selections, which could be preferable and suitable to a particular location.

Hence, locally grown popular genotypes having variations in growth, yield, fruit characters and tolerance to bacterial wilt

along with fruit and shoot borer resistance were selected from different part of the Konkan region, for further utilization in crop improvement programme. Keeping all these above mentioned points in view, an experiment was carried out to evaluate 20 F₁ progenies of brinjal under Konkan agro-climatic conditions during *Rabi* season 2017-18.

Materials and Methods

The field experiment was conducted at Vegetable Improvement Scheme, Central Experiment Station, Wakawali, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri, (M.S.) during *Rabi* season of the year 2017-18. The experiment was laid out in Randomized Block Design with twenty treatments namely, T₁ (DPL Br-3 × DPL Br-11), T₂ (DPL Br-3 × DPL Br-13), T₃ (DPL Br-3 × DPL Br-14), T₄ (DPL Br-3 × DPL Br-18), T₅ (DPL Br-11 × DPL Br-3), T₆ (DPL Br-11 × DPL Br-13), T₇ (DPL Br-11 × DPL Br-14), T₈ (DPL Br-11 × DPL Br-18), T₉ (DPL Br-13 × DPL Br-3), T₁₀ (DPL Br-13 × DPL Br-11), T₁₁ (DPL Br-13 × DPL Br-14), T₁₂ (DPL Br-13 × DPL Br-18), T₁₃ (DPL Br-14 × DPL Br-3), T₁₄ (DPL Br-14 × DPL Br-11), T₁₅ (DPL Br-14 × DPL Br-13), T₁₆ (DPL Br-14 × DPL Br-18), T₁₇ (DPL Br-18 × DPL Br-3), T₁₈ (DPL Br-18 × DPL Br-11), T₁₉ (DPL Br-18 × DPL Br-13), T₂₀ (DPL Br-18 × DPL Br-14) which were replicated for two times. Flat beds of dimension 4 m x 3 m were prepared. Mulching was done with black mulch paper and then transplanting was done when seedlings were 45 days old at spacing of 60 cm between row to row and plant to plant. Gap filling was done 15 days after transplanting to replace the dead seedling. Application of fertilizers @ 150 kg N, 50 kg P₂O₅ and 50 kg K₂O per hectare was done. Manual weeding was done whenever necessary to keep plot free from

weed. Observations were recorded from randomly selected plants from each treatment per replication. The yield and yield attributing characters were computed their mean values. The data obtained in the present investigation were statistically analysed by the method suggested by Panse and Sukhatme (1995).

Results and Discussions

The data presented in Table 1 shows that minimum number of days required for first harvest (71.10 days) was recorded in progeny DPL Br-14 × DPL Br-13 (T₁₅), whereas the maximum number of days (87.50 days) was recorded in the progeny DPL Br-13 × DPL Br-11 (T₁₀). The maximum number of days (124.20 days) required for last harvest were recorded in DPL Br-18 × DPL Br-3 (T₁₇) while minimum number of days (118.60 days) to last harvest was reported in progeny DPL Br-11 × DPL Br-14 (T₇). However, maximum pickings (8.50) was recorded in the progeny DPL Br-18 × DPL Br-3 (T₁₇), whereas minimum number of pickings (6.70) was observed in progeny DPL Br-11 × DPL Br-13 (T₆) and DPL Br-3 × DPL Br-18 (T₄).

The variation in brinjal progenies for days to harvest was also noticed by Ashwani and Khandelwal (2003), Thapa *et al.*, (2005), Khapate *et al.*, (2012), Magar (2014), Haldavanekar (2015), Bhambure (2016) and Kharate (2018) in their study on brinjal genotypes.

The data presented in Table 2 shows that longest fruit (15.26 cm) were found in the progeny DPL Br-18 × DPL Br-3 (T₁₇) and shortest fruits (10.41 cm) were obtained from the progeny DPL Br-13 × DPL Br-14 (T₁₁). Progeny DPL Br-13 × DPL Br-14 (T₁₁) reported maximum fruit breadth (5.51

cm) and minimum fruit breadth was recorded from progeny DPL Br-18 × DPL Br-3 (T₁₇) (3.36 cm).

maximum number of fruits plant⁻¹ (23.29) was recorded in progeny DPL Br-18 × DPL Br-3 (T₁₇) and minimum number (14.05) of fruits per plant was reported in progeny DPL Br-13 × DPL Br-14 (T₁₁).

The data presented in Table 3 shows that

Table.1 Variation in number of days to first and last harvest and number of pickings in different progenies of brinjal

| Treat. No. | Treatments | Days to | | Number of pickings* |
|-----------------|-----------------------|----------------|----------------|---------------------|
| | | First harvest* | Last harvest* | |
| T ₁ | DPL Br-3 × DPL Br-11 | 73.40 | 120.20 | 7.50 |
| T ₂ | DPL Br-3 × DPL Br-13 | 73.00 | 120.40 | 7.60 |
| T ₃ | DPL Br-3 × DPL Br-14 | 76.20 | 119.50 | 7.10 |
| T ₄ | DPL Br-3 × DPL Br-18 | 80.20 | 118.80 | 6.70 |
| T ₅ | DPL Br-11 × DPL Br-3 | 74.90 | 119.00 | 7.10 |
| T ₆ | DPL Br-11 × DPL Br-13 | 83.20 | 123.10 | 6.70 |
| T ₇ | DPL Br-11 × DPL Br-14 | 81.90 | 118.60 | 7.10 |
| T ₈ | DPL Br-11 × DPL Br-18 | 77.60 | 119.90 | 7.20 |
| T ₉ | DPL Br-13 × DPL Br-3 | 76.40 | 122.30 | 7.40 |
| T ₁₀ | DPL Br-13 × DPL Br-11 | 87.50 | 120.10 | 7.10 |
| T ₁₁ | DPL Br-13 × DPL Br-14 | 75.50 | 118.80 | 7.40 |
| T ₁₂ | DPL Br-13 × DPL Br-18 | 80.70 | 120.70 | 6.80 |
| T ₁₃ | DPL Br-14 × DPL Br-3 | 74.60 | 122.00 | 8.10 |
| T ₁₄ | DPL Br-14 × DPL Br-11 | 74.40 | 120.80 | 7.70 |
| T ₁₅ | DPL Br-14 × DPL Br-13 | 71.10 | 119.90 | 8.20 |
| T ₁₆ | DPL Br-14 × DPL Br-18 | 74.80 | 120.10 | 7.50 |
| T ₁₇ | DPL Br-18 × DPL Br-3 | 75.50 | 124.20 | 8.50 |
| T ₁₈ | DPL Br-18 × DPL Br-11 | 80.90 | 120.50 | 7.10 |
| T ₁₉ | DPL Br-18 × DPL Br-13 | 79.30 | 119.50 | 7.90 |
| T ₂₀ | DPL Br-18 × DPL Br-14 | 76.70 | 119.80 | 7.70 |
| | Range | 71.10 – 87.50 | 118.60- 124.20 | 6.70 - 8.50 |
| | Mean | 77.39 | 120.41 | 7.42 |
| | Result | SIG. | SIG. | SIG. |
| | SEm (±) | 0.353 | 0.256 | 0.11 |
| | CD at 5% | 1.045 | 0.757 | 0.35 |

*Mean of two replications

Table.2 Length and breadth of fruits of progenies of brinjal

| Treat. No. | Treatments | Fruit Dimensions* | |
|-----------------|-----------------------|-------------------|--------------|
| | | Length (cm) | Breadth (cm) |
| T ₁ | DPL Br-3 × DPL Br-11 | 13.71 | 3.36 |
| T ₂ | DPL Br-3 × DPL Br-13 | 13.13 | 3.90 |
| T ₃ | DPL Br-3 × DPL Br-14 | 11.77 | 4.00 |
| T ₄ | DPL Br-3 × DPL Br-18 | 14.28 | 3.48 |
| T ₅ | DPL Br-11 × DPL Br-3 | 13.64 | 3.45 |
| T ₆ | DPL Br-11 × DPL Br-13 | 11.57 | 4.17 |
| T ₇ | DPL Br-11 × DPL Br-14 | 12.20 | 4.30 |
| T ₈ | DPL Br-11 × DPL Br-18 | 12.93 | 4.01 |
| T ₉ | DPL Br-13 × DPL Br-3 | 12.21 | 4.23 |
| T ₁₀ | DPL Br-13 × DPL Br-11 | 12.42 | 4.17 |
| T ₁₁ | DPL Br-13 × DPL Br-14 | 10.41 | 5.51 |
| T ₁₂ | DPL Br-13 × DPL Br-18 | 10.83 | 4.87 |
| T ₁₃ | DPL Br-14 × DPL Br-3 | 12.11 | 3.94 |
| T ₁₄ | DPL Br-14 × DPL Br-11 | 10.77 | 4.60 |
| T ₁₅ | DPL Br-14 × DPL Br-13 | 10.73 | 5.03 |
| T ₁₆ | DPL Br-14 × DPL Br-18 | 12.12 | 3.82 |
| T ₁₇ | DPL Br-18 × DPL Br-3 | 15.26 | 3.36 |
| T ₁₈ | DPL Br-18 × DPL Br-11 | 13.31 | 4.04 |
| T ₁₉ | DPL Br-18 × DPL Br-13 | 13.74 | 4.35 |
| T ₂₀ | DPL Br-18 × DPL Br-14 | 12.82 | 4.32 |
| | Range | 10.41 – 15.26 | 3.36 - 5.51 |
| | Mean | 12.49 | 4.14 |
| | Result | SIG. | SIG. |
| | SEm (±) | 0.288 | 0.121 |
| | CD at 5% | 0.852 | 0.358 |

*Mean of two replications

Table.3 Fruit yield and yield attributing parameters of different progenies of brinjal

| Treat. No. | Treatment details | Number of fruits* plant⁻¹ | Weight* (g) | Fruit yield* plant⁻¹(Kg) | Yield* plot⁻¹ (Kg) | Yield* ha⁻¹ (quintal) |
|-------------------|--------------------------|---|--------------------|--|--------------------------------------|---|
| T ₁ | DPL Br-3 × DPL Br-11 | 16.00 | 109.00 | 1.17 | 17.51 | 145.88 |
| T ₂ | DPL Br-3 × DPL Br-13 | 23.40 | 84.10 | 1.37 | 23.95 | 199.57 |
| T ₃ | DPL Br-3 × DPL Br-14 | 19.30 | 71.20 | 1.25 | 21.23 | 176.94 |
| T ₄ | DPL Br-3 × DPL Br-18 | 18.50 | 82.10 | 1.34 | 21.47 | 178.93 |
| T ₅ | DPL Br-11 × DPL Br-3 | 23.95 | 86.60 | 1.55 | 24.06 | 200.52 |
| T ₆ | DPL Br-11 × DPL Br-13 | 15.70 | 75.50 | 0.99 | 15.90 | 132.53 |
| T ₇ | DPL Br-11 × DPL Br-14 | 15.55 | 74.50 | 0.97 | 17.42 | 145.20 |
| T ₈ | DPL Br-11 × DPL Br-18 | 21.23 | 84.40 | 1.33 | 22.63 | 188.56 |
| T ₉ | DPL Br-13 × DPL Br-3 | 20.85 | 79.50 | 1.30 | 20.78 | 173.20 |
| T ₁₀ | DPL Br-13 × DPL Br-11 | 16.00 | 72.90 | 0.98 | 17.55 | 146.25 |
| T ₁₁ | DPL Br-13 × DPL Br-14 | 14.05 | 79.80 | 0.91 | 16.34 | 136.20 |
| T ₁₂ | DPL Br-13 × DPL Br-18 | 16.15 | 82.60 | 1.04 | 18.65 | 155.40 |
| T ₁₃ | DPL Br-14 × DPL Br-3 | 19.60 | 85.00 | 1.34 | 20.06 | 167.13 |
| T ₁₄ | DPL Br-14 × DPL Br-11 | 16.00 | 73.60 | 0.96 | 16.35 | 136.28 |
| T ₁₅ | DPL Br-14 × DPL Br-13 | 19.10 | 82.20 | 1.27 | 20.26 | 168.80 |
| T ₁₆ | DPL Br-14 × DPL Br-18 | 17.00 | 86.60 | 1.16 | 19.65 | 163.77 |
| T ₁₇ | DPL Br-18 × DPL Br-3 | 26.95 | 100.90 | 1.78 | 24.91 | 207.55 |
| T ₁₈ | DPL Br-18 × DPL Br-11 | 14.80 | 85.00 | 0.92 | 15.67 | 130.62 |
| T ₁₉ | DPL Br-18 × DPL Br-13 | 18.60 | 78.40 | 1.28 | 21.76 | 181.33 |
| T ₂₀ | DPL Br-18 × DPL Br-14 | 15.40 | 74.00 | 0.94 | 16.90 | 140.85 |
| | Range | 14.05 – 26.95 | 71.20 - 109.00 | 0.91 - 1.78 | 15.67 – 24.91 | 130.62 - 207.55 |
| | Mean | 18.40 | 82.39 | 1.19 | 19.65 | 163.78 |
| | Result | SIG. | SIG. | SIG. | SIG. | SIG. |
| | SEm (±) | 0.281 | 1.02 | 0.04 | 0.708 | 5.904 |
| | CD at 5% | 0.832 | 3.04 | 0.13 | 2.097 | 17.474 |

*Mean of two replications

Kekan (2018) studied fourteen various local genotypes of brinjal were yield per plant ranged from 0.84 kg to 2.04 kg in brinjal genotypes. Progeny DPL Br-3 × DPL Br-11 (T₁) produced fruit with maximum weight (109.00 g). On the contrary, minimum fruit weight (71.20 g) obtained from the progeny DPL Br-3 × DPL Br-14 (T₃). Kharate (2018) reported the weight of fruit ranged from 54.20 to 128.00 g. The progeny DPL Br-18 × DPL Br-3 (T₁₇) reported the highest fruit yield per plant (1.78 kg) and lowest fruit yield per plant (0.91 kg) was reported in progeny DPL Br-13 × DPL Br-14 (T₁₁). Maximum yield per plot (14.44 kg) and yield per hectare (207.55 q/ha) was obtained by progeny DPL Br-18 × DPL Br-3 (T₁₇) and minimum (15.67 kg) was recorded in progeny DPL Br-18 × DPL Br-11 (T₁₈).

Hence concluded, thus from the present investigation it is evident that the brinjal progeny viz., DPL Br-14 × DPL Br-13 has reported minimum days to first harvest. Progeny DPL Br-18 × DPL Br-3 recorded maximum number of fruits, highest yield per plot and highest yield per hectare compared to other progenies.

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