

Evaluation of Tomato Cultivars for Their Performance under Intermediate Zone of Jammu and Kashmir

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Abstract

To investigate the genetic variation, seven tomato genotypes were assessed during summer of 2006 and 2007 for suitability over large areas of intermediate zone of J & K in context of production and future breeding program as parent line. Two (Swarna Lalima and Swarna Naveen) out of seven genotypes were found to be most promising for prolific growth and higher yield. Swarna Lalima produced significantly highest number of branches per plant (7.22), fruit weight (80.85), fruit yield per plot (21.56 kg) and maximum percentage of survival (89.10) after 90 DAT. Whereas maximum attainment of plant height (133.9 cm) and fruit yield per ha (449.45 q) were observed in Swarn Naveen. The magnitude of increase in fruit yield per ha was 24.62% in Swarna Lalima and 16.26% in Swarna Naveen than Pusa Ruby used as local check. However, other rest cultivar poorly performed in morphologically traits and yield attributing characters.

Key words : Tomato, Cultivar, Productivity.

Tomato is one of the foremost vegetable crops of India. It is estimated that presently 10% area of vegetable is only under hybrids of which tomato covers 36% and rest other major parts are in general open pollinated. It is cultivated in 534.5 thousand hectare area with annual production of 9381.8 thousand metric tones (1). In J & K state also, it is cultivated as one of the most prized vegetable in 15.16 ha area with annual production of 34,500 mt (2) in areas ranging from subtropical plains and intermediate to temperate zone and cold arid regions (3). With the advancement in technology and coming up of new hybrids, open pollinated varieties are being replaced fast in the state particularly in subtropical plains. However, area under hybrids is still very limited particularly in intermediate zone mainly due to relative higher cost of hybrids seeds, small and marginal land holdings in hilly patches and hybrids requiring more inputs and assured irrigation to express its full potential which ultimately increase their cost of production. Therefore, it requires attention to replace the local cultivar with the improved high yielding varieties in respect of varietal development through identification and evaluation of early fruiting and high yielding open polli-

nated varieties for their feasibility for domestic and export market and it is also essential from breeding point of view (4). There is an urgent need to identify different cultivars/varieties suitable for different agro climates and growing seasons since availability of appropriate genotypes for growing tomato during summer season is although a constraint (5). Therefore, more quantitative information is required to develop a balanced strategy for increasing the tomato production and productivity without affecting the present cost of production, the present study was undertaken to evaluate cultivars of tomato for their performance under intermediate zone of J & K.

Methods

A trial with genotype comprising seven cultivars of tomato namely Summer Special, Punjab Chuhara, PKM-1, S-22, Swarn Lalima, Swarn Naveen and Pusa Ruby (as check) were evaluated in randomized block design replicated four times at Regional Agricultural Research Station Rajouri, SKUAST-J situated at 980 masl during 2006 and 2007 in summer. The different varieties were sown in March and transplanted the

Table 1. Evaluation of tomato cultivars for their performance under intermediate zone of J & K. (Pooled data of two years i.e. 2006-07).

| Cultivars | Percentage survival | Plant height cm | Number of branches/plant | Number of fruit/plant | Fruit weight (g) | Fruit yield/plot (kg) | Fruit yield/ha (q) |
|----------------|---------------------|-----------------|--------------------------|-----------------------|------------------|-----------------------|--------------------|
| Summer Special | 80.35 | 59.3 | 5.29 | 25.25 | 47.65 | 15.50 | 358.85 |
| Punjab Chuhara | 86.2 | 94.05 | 5.37 | 30.75 | 41.25 | 14.53 | 326.45 |
| PKM-1 | 79.85 | 79.60 | 6.52 | 25.20 | 51.5 | 13.24 | 306.35 |
| S-22 | 81.25 | 81.10 | 4.65 | 22.80 | 43.2 | 13.43 | 310.90 |
| Swarn Lalima | 89.10 | 87.30 | 7.22 | 30.20 | 80.85 | 21.56 | 499.3 |
| Swarn Naveen | 80.35 | 133.9 | 6.96 | 29.70 | 42.05 | 19.42 | 449.45 |
| Pusa Ruby | 75.45 | 122.4 | 6.26 | 28.15 | 47.15 | 16.25 | 376.35 |
| CD (0.05) | 2.87 | 7.22 | 0.44 | 3.20 | 7.40 | 2.10 | 22.4 |

same in April in a plot size of 3m × 3 m with spacing of 60 × 45 cm to give a plant density of 30 per plot (37,037 plant population per ha). All the cultural activities were adopted uniformly and regularly following package of practices recommended by SKUAST-Jammu. The observations were taken on five competitive plants from each replication for plant height, number of branches per plant, number of fruits per plant and fruit weight where as percentage of survival (90 DAT) and fruit yield were calculated on per plot basis the pooled data for both the year were analyzed by following Gomez and Gomez (6).

Results and Discussion

A wide range of variation was noticed among the different cultivar in respect of their mean survival percentage with the maximum (89.10) in Swarn Lalima and the minimum in Pusa Ruby (75.45%). Moreover, Swarn Lalima was significantly superior over all other cultivar (Table 1).

Morphological traits particularly plant height was in the favor of Swarn Naveen (133.9 cm) followed by Pusa Ruby (122.4 cm), which might be due to their determinate and indeterminate growth habit (5). The maximum number of branches per plant registered under Swarn Lalima (7.22) and Swarn Naveen (6.96) while minimum observed in summer special (5.29).

The mean value of number of fruits per plant also varied significantly among the genotypes. The mean values of number of fruits per plant ranged from 22.80 (S-22) to 30.75 (Punjab chuhara) whereas mean fruit weight is concern a maximum fruit weight of 80.85 g

was observed in Swarn Lalima which was significantly superior among all other cultivars over Pusa Ruby. Moreover, lower number of fruit weight (42.05 g) was recorded in Swarn Naveen.

The marketable yield per plot was noted highest under Swarn Lalima (21.56 kg) followed by Swarn Naveen (19.42 kg) whereas yield per ha was in the favor of Swarn Naveen (449.45 q) and Swarn lalima (499.3 q). The magnitude of increase in fruit yield per ha was 24.62 percent in Swarn lalima and 16.26% in Swarn Naveen than Pusa Ruby. Similar finding regarding yield and yield attributes were observed by Bhadoria et al. (7). The highest yield recorded in Swarn lalima can be attributed to the maximum number of branches per plant and maximum number of fruits per plant but most importantly highest average fruit weight. Singh and Cheema (8) observed a strong positive correlation of fruit yield with number of branches, number of fruits per plant and average fruit weight, also signifies the importance of total yield/plant, number of fruits per plant, fruit weight for improving overall marketable yield potential of tomato.

Conclusion

Thus it may be concluded that cultivars Swarn Lalima and Swarn Naveen proved themselves to be best cultivar among seven genotypes tested so far in summer season in respect of overall performance particularly growth and production potential of view and both cultivars can be used for fruitful cultivation over large area under the intermediate zone of J & K state for gaining maximum production and productivity and future breeding program as parent line.

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