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# Evaluation of Cherry Tomato (*Solanum Lycopersicum* L. var. *cerasiforme*) Genotypes for Growth and Yield Parameters

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**A B S T R A C T**

An experiment entitled Evaluation of cherry tomato (*Solanum lycopersicum* L. var. *cerasiforme*) genotypes for growth and yield parameters was conducted in the Department of Vegetable Science, College of Horticulture, Bengaluru, Karnataka during the year 2018-19. In present study, twenty one cherry tomato genotypes were evaluated for growth, and yield parameters. Among different genotypes, COHBT-199 genotype recorded maximum plant height (261.10 cm) and minimum height was recorded in COHBT-206 (179.50 cm). Genotype COHBT-199, COHBT-27 and COHBT-70 recorded maximum number of branches per plant (23.80) and minimum was recorded in COHBT -198 (20.50). Earliness reported in COHBT-199 (24.00 days) and maximum was recorded in COHBT-217 (32.50 days). COHHT-199 genotype recorded maximum number of flowers per cluster (10.64) and number of fruits per cluster (8.75) and minimum number of fruits per cluster was recorded in COHBT-191 (3.00).Among different cherry tomato genotypes, maximum fruit length was recorded in COHBT-198 (5.00 cm). The maximum fruit girth (4.00 cm) was recorded in COHBT-209, COHBT-198 and COHBT-208. Genotype COHBT-198 recorded maximum average fruit weight (43.90 g). The maximum fruit yield per plant was recorded in genotype COHBT-198(2.30 kg).

## Introduction

Tomato (*Solanum lycopresicum L.*) is one of the most important solanaceous vegetable crops grown widely all over the world and is native to South America (Rick, 1969). Botanically cherry tomato is called *Solanum lycopersicum* var. *cerasiforme* having chromosome number 2n=24. It is thought to be the ancestor of all cultivated tomatoes. It is widely cultivated in Central America and is distributed in California, Korea, Germany, Mexico and Florida. It is a warm season crop reasonably tolerant to heat and drought and

grows under wide range of soil and climatic conditions. (Anon., 2009a) Cherry tomato is grown for its edible fruits which can be consumed either fresh as a salad of after cooking as snacks. They are perfect for making processed products like sauce, soup, ketchup, puree, curries, paste, powder and sandwich. Unripe green fruit are used for preparation of pickles and chutney. The fruit size range from thumb tip to the size of a golf ball and can range from being spherical to slightly oblong in shape (Anon., 2009b).

## Materials and Methods

An experiment was carried out to study Evaluation of cherry tomato *(Solanum lycopersicum* L. var. *cerasiforme)* genotypes for growth and yield was under taken during Jun2018 (Kharif season)at Department of Vegetable Science, College of Horticulture Bengaluru, University of Horticultural Sciences, Bagalkot. The experiment site is located at an of 930 meters above mean sea level (MSL) at 12.97˚ N latitude and 77.56˚ E longitudes in the Eastern Dry Zone of Karnataka (Zone-V).

### Nursery and agronomic practices

Cherry tomato seeds were sown in plastic pro-trays having 98 cells. Regular irrigation and plant production measure were taken to raise the good quality seedlings using growing media like mixture of coco peat and farm yard manure in 2:1 ratio. pro-trays are kept in green house.

### Field preparation and transplanting

During July 2018, field was brought to fine tilth by ploughing and harrowing. Farm yard manure was incorporated to the soil and bed covered by plastic mulch. The 25 days old seedling were transplanted at the spacing of 90cm × 60cm. The experiment plots were kept free from weeds by hand weeding at frequent interval. All agronomic practices were taken as per the recommendations of package of practices of University of Horticultural Sciences, Bagalkot.

### Plant height

Plant height was measured in centimeters from the ground level to the tip of the plant at 30, 60, 90 and 120 day after transplanting (DAT) was expressed in centimeters.

### Number of branches per plant

Number of branches per plant were counted at 30, 60, 90 and 120 day after transplanting (DAT).

### Days to 50 per cent flowering

Number of days taken from the date of transplanting to first flower appearance in 50 percentage of the plant population in each replication was recorded and the average was computed.

### Number of flowers per cluster

Three clusters per plant were taken from five tagged plants in each replication and number of flowers in each cluster was counted at full bloom. Then the average number of flowers per cluster was calculated.

### Number of fruits per cluster

Before first picking, three fruit bunches were chosen at random in five tagged plant in both the replications to calculate the average number of fruits per cluster.

### Fruit length (cm)

Five randomly selected fruits of each genotype in each replications were measured

for fruit length (cm) at peak fruiting with the help of vernier caliper and the average was calculated.

### Fruit girth (cm)

Five randomly selected fruits from five tagged plants of each genotype from each replication were measured for fruit girth (cm) at peak fruiting with the help of vernier caliper and the average was calculated.

### Average fruit weight (g)

Average fruit weight was calculated by adding weight of ten randomly selected fruits from each of tagged plants and it was computed by using following formula.

$$\text{Average fruit weight} = \frac{\text{Total fruit weight}}{\text{Total no. of fruits}}$$

### Fruit yield per plant (kg)

Total weight of fruits harvested from five tagged plants of all the pickings were added and average yield per plant was worked out and expressed in kilograms per plant (kg/plant).

## Results and Discussion

### Plant height

Plant height is an indication of plant health, it's robustness and determines the number of branches and foliage. Better the plant height better exposure of plant to solar interception of canopy and better biomass accumulation and translocation.

Plant height showed significant at 30 DAP 60, 90 and 120 DAP resulted significant difference among genotypes. Plant height ranged from 98.50cm to 180.20cm, 156.80cm to 243.00cm and 179.50cm to 261.10cm at 60, 90 and 120 DAP respectively.

These results were in concurrence with the earlier findings of Nitzsche *et al.,* (2003), Kumar *et al.,* (2014) and Renuka *et al.,* (2014) in cherry tomato.These indeterminate growth habits are mainly preferred because of their longer harvest duration Prema *et al.,* (2011a).

### Number of branches per plant

Number of branches per plant ranged from 4.30 to 11.70, 11.10 to 15.30, 18.20 to 22.00 and 20.90 to 23.80at 30, 60, 90 and 120 DAP respectively. More number of branches results in more production of leaves, the size of the leaf and number of leaves which decides the efficiency of photosynthesis activity which contributed towards better translocation efficiency lead to better growth and yield.

Mahendrakar *et al.,* (2006) and Gomathi (2008) also observed the similar result of more number of branches per plant in tomato. Such information on variation in number of primary branches per plant was also available from the studies of Kumar *et al.,* (2014) and Renuka *et al.,* (2014) in cherry tomato.

### Days of 50 per cent of flowering DAP

The data with respect to days of 50 per cent of flowering did not vary significantly among different cherry tomato genotypes. A numerically maximum day of 50 per cent of flowering was recorded in COHBT- 217 (32.50 days) which was on par with COHBT-46, COHBT- 27 and COHBT- 270 (32.00 days) and minimum of recorded in COHBT-199 (24.00 days).Such earliness could be due to its higher capacity to make available assimilates to the apex during the sensitive phase before initiation Prema *et al.,* (2011a) and Alam *et al.,* (2014).

## Number of flowers per cluster

Development of genotypes with more number of flowers per cluster and more number of clusters per plant helps to increase the yield through more fruits per plant. The maximum number of flowers per cluster was observed in COHHT-199 (10.64) which was followed by COHBT-198 (9.75) and minimum was observed in COHBT- 191 (5.60). These results were in concurrence with the earlier findings Renuka *et al.,* (2014) in cherry tomato.

## Number of fruits per cluster

This might be due to the prevalence of micro climate with better environmental condition with optimum temperature would helped in the better pollination and ultimately leads to fruit set. The maximum number of fruits per cluster was recorded in COHBT (8.75) and minimum was recorded in COHBT-191 (3.00).The results are similar with Singh *et al.,* (2000) reported number of fruits per cluster ranged from 4.30 to 8.70 with over all mean of 5.90 and Mohanty (2003), Prashanth (2003), Mehta and Asati (2008) and Prema *et al.,* (2011a) also reported similar results.

## Fruit length

Significantly maximum fruit length was observed in fruit length showed significant differences among the different cherry tomato genotypes.The maximum fruit length was observed in COHBT- 198 (5.00cm) which was followed by COHBT- 36 (4.05cm) and minimum was observed in COHBT- 262 (1.75cm). The shorter fruit length of cherry tomato genotypes may due to character of *cerasiforme* species. The present result correlates with the outcome of Kumar *et al.,* (2014) in cherry tomato. Similar finding have been reported by Trivedi (1996), Naidu (2001), Ghosh *et al.,* (2010), Kaushik *et al.,* (2011), Prema *et al.,* (2011), Islam *et al.,* (2012) and Manna and Paul (2012).

## Fruit girth

The shorter fruit girth of cherry tomato genotypes may due to character of *cerasiforme* species. The present result correlates with the outcome of Kumar *et al.,* (2014) in cherry tomato. Significantly maximum fruit girth (4.00cm) was observed in COHBT- 209, COHBT- 198 and COHBT-208 which was on par COHBT- 206 (3.90cm) and minimum was observed in COHBT- 262 (1.65cm). Similar finding have been reported by Trivedi (1996), Naidu (2001), Ghosh *et al.,* (2010), Kaushik *et al.,* (2011), Prema *et al.,* (2011), Islam *et al.,* (2012) and Manna and Paul (2012).

## Average fruit weight

Significant differences among the different cherry tomato genotypes are presented in. The maximum average fruit weight was observed in COHBT-198 (43.90g) which was followed by COHBT-70 (38.90g) and minimum was observed in COHBT- 262 (3.50g).This variation in average fruit weight might be due to inverse relationship existing between average fruit weight, and number of fruits per cluster. This was conformity with the findings of Renuka *et al.,* (2017).

## Fruit yield per plant

The average fruit weight directly contributes towards the fruit yield per plant. This was in agreement with the finding of Deepa and Thakur (2008) in tomato. The fruit yield per plant showed significant differences among the different cherry tomato genotypes. The maximum fruit yield per plant was recorded in COHBT-198 (2.30kg) which was followed by COHBT- 70 (2.20kg) and minimum was recorded in COHBT- 270 (1.00kg).

**Table.1** Variation of cherry tomato genotypes for growth parameters

| Treatment | Genotypes | Plant height (cm) | | | | Number of branch par plant | | | | Days to 50 % flowering |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 30 DAP | 60 DAP | 90 DAP | 120 DAP | 30 DAP | 60 DAP | 90 DAP | 120 DAP | |
| $T_1$ | COHBT-253 | 69.10$^{defgh}$ | 135.80$^{gh}$ | 183.40$^{cde}$ | 198.10$^{fgh}$ | 4.30$^{e}$ | 11.60$^{ef}$ | 18.20$^{i}$ | 21.50$^{bcdef}$ | 31.00 |
| $T_2$ | COHBT -46 | 66.30$^{def}$ | 161.00$^{cd}$ | 233.70$^{ab}$ | 245.10$^{bcd}$ | 6.20$^{de}$ | 11.10$^{f}$ | 20.40$^{bc}$ | 22.40$^{ebcde}$ | 32.00 |
| $T_3$ | COHBT-27 | 74.80$^{bcd}$ | 141.60$^{efg}$ | 193.30$^{c}$ | 207.10$^{ef}$ | 7.40$^{cd}$ | 11.60$^{ef}$ | 19.80$^{cdef}$ | 23.80$^{a}$ | 32.00 |
| $T_4$ | Red Round | 66.40$^{defgh}$ | 143.50$^{efg}$ | 229.00$^{ab}$ | 241.30$^{cd}$ | 7.30$^{d}$ | 13.30$^{bcde}$ | 20.10$^{bcde}$ | 23.00$^{abc}$ | 28.00 |
| $T_5$ | COHBT-68 | 66.80$^{defgh}$ | 129.10$^{hi}$ | 156.80$^{f}$ | 196.20$^{gh}$ | 7.10$^{de}$ | 11.00$^{f}$ | 19.80$^{cdef}$ | 23.40$^{a}$ | 29.00 |
| $T_6$ | COHBT-270 | 48.40$^{defgh}$ | 142.20$^{efg}$ | 189.70$^{cb}$ | 203.10$^{efg}$ | 8.00$^{bcd}$ | 13.10$^{bcde}$ | 20.20$^{bcd}$ | 21.50$^{bcdef}$ | 32.00 |
| $T_7$ | COHBT -262 | 57.30$^{gh}$ | 124.90$^{i}$ | 232.00$^{ab}$ | 241.00$^{cd}$ | 7.00$^{de}$ | 13.60$^{abcd}$ | 20.40$^{bc}$ | 23.60$^{a}$ | 30.00 |
| $T_8$ | COHBT-217 | 59.10$^{efgh}$ | 136.50$^{gh}$ | 184.70$^{cde}$ | 194.80$^{gh}$ | 7.20d$^{e}$ | 11.60$^{ef}$ | 20.70$^{b}$ | 23.10$^{ab}$ | 32.50 |
| $T_9$ | COHBT-70 | 58.80$^{h}$ | 136.70$^{gh}$ | 195.50$^{c}$ | 209.60$^{e}$ | 10.60$^{ab}$ | 12.00$^{def}$ | 21.80$^{e}$ | 23.80$^{a}$ | 31.00 |
| $T_{10}$ | COHBT-44 | 82.60$^{ab}$ | 172.70$^{ab}$ | 238.80$^{a}$ | 246.00$^{bc}$ | 8.40$^{bcd}$ | 12.80$^{cdef}$ | 20.50$^{bc}$ | 22.80$^{abcd}$ | 29.50 |
| $T_{11}$ | Yellow Round | 70.50$^{def}$ | 163.70$^{bc}$ | 236.80$^{a}$ | 200.00$^{efgh}$ | 8.30$^{bcd}$ | 12.80$^{cdef}$ | 18.30$^{i}$ | 21.20$^{def}$ | 30.00 |
| $T_{12}$ | COHBT -198 | 73.30$^{bcd}$ | 140.10$^{fg}$ | 186.60$^{cde}$ | 251.80$^{ab}$ | 7.90$^{bcd}$ | 14.00$^{abc}$ | 20.60$^{bc}$ | 20.50$^{f}$ | 30.50 |
| $T_{13}$ | COHBT-209 | 62.30$^{efgh}$ | 137.70$^{gh}$ | 180.70$^{cde}$ | 192.00$^{h}$ | 10.30$^{abc}$ | 13.50$^{abcd}$ | 19.50$^{def}$ | 22.20$^{abcde}$ | 30.50 |
| $T_{14}$ | COHBT -71 | 70.50$^{cde}$ | 123.10$^{i}$ | 187.90$^{cde}$ | 199.90$^{efgh}$ | 7.60$^{cd}$ | 12.80$^{cdef}$ | 18.40$^{hi}$ | 21.10$^{ef}$ | 29.50 |
| $T_{15}$ | COHBT -48 | 72.00$^{bcd}$ | 148.40$^{ef}$ | 176.50$^{de}$ | 191.60$^{h}$ | 7.10$^{de}$ | 13.20$^{bcde}$ | 18.50$^{ghi}$ | 21.50$^{bcdef}$ | 31.50 |
| $T_{16}$ | COHBT-31 | 86.90$^{abc}$ | 151.40$^{de}$ | 181.30$^{cde}$ | 197.80$^{efg}$ | 8.50$^{bcd}$ | 15.30$^{a}$ | 20.40$^{bc}$ | 22.90$^{abc}$ | 31.00 |
| $T_{17}$ | COHBT-36 | 54.80$^{def}$ | 137.20$^{gh}$ | 227.40$^{ab}$ | 241.20$^{cd}$ | 7.00$^{de}$ | 14.70$^{ab}$ | 19.30$^{efg}$ | 20.80$^{ef}$ | 31.00 |
| $T_{18}$ | COHBT -199 | 94.00$^{a}$ | 180.20$^{a}$ | 243.00$^{a}$ | 261.10$^{a}$ | 11.70$^{a}$ | 14.10$^{abc}$ | 22.00$^{a}$ | 23.80$^{a}$ | 24.00 |
| $T_{19}$ | COHBT-208 | 69.90$^{de}$ | 121.80$^{i}$ | 219.20$^{b}$ | 235.30$^{d}$ | 8.50$^{bcd}$ | 13.30$^{bcde}$ | 19.40$^{def}$ | 20.90$^{ef}$ | 31.00 |
| $T_{20}$ | COHBT -206 | 63.80$^{defgh}$ | 98.50$^{j}$ | 172.60$^{e}$ | 179.50$^{i}$ | 7.70$^{bed}$ | 12.60$^{cdef}$ | 19.20$^{fgh}$ | 21.40$^{cdef}$ | 30.50 |
| $T_{21}$ | COHBT -191 | 58.60$^{defg}$ | 150.30$^{e}$ | 229.00$^{ab}$ | 237.00$^{cd}$ | 8.30$^{bed}$ | 14.40$^{abc}$ | 22.50$^{a}$ | 23.40$^{a}$ | 30.50 |
| **Mean** | | 69.68 | 141.73 | 203.71 | 217.60 | 7.92 | 12.97 | 20.00 | 22.31 | 30.33 |
| **S.Em±** | | 2.00 | 6.27 | 10.85 | 12.48 | 0.45 | 0.63 | 0.75 | 0.80 | 1.47 |
| **CD at 5%** | | 11.81 | 18.51 | 32.01 | 36.83 | 1.35 | 1.87 | 2.22 | 2.37 | NS |
| **CV** | | 8.16 | 6.28 | 7.55 | 8.27 | 8.42 | 6.91 | 5.35 | 5.15 | 6.88 |

**Table.2** Variation of cherry tomato genotypes for yield parameters

| Treatment | Genotypes | No. of flowers per cluster | No. of fruits per cluster | Fruit length (cm) | Fruit girth (cm) | Avg. fruit weight (g) | Fruit yield per plant (kg) |
|---|---|---|---|---|---|---|---|
| $T_1$ | COHBT-253 | 7.30$^{cde}$ | 5.25$^{cd}$ | 3.50d$^{ef}$ | 2.95$^{cde}$ | 26.25$^{gh}$ | 2.00$^{b}$ |
| $T_2$ | COHBT -46 | 6.80d$^{efg}$ | 4.00$^{f}$ | 3.45$^{defg}$ | 3.95$^{a}$ | 31.55$^{e}$ | 1.30$^{fgh}$ |
| $T_3$ | COHBT-27 | 7.30$^{cde}$ | 4.50$^{def}$ | 3.55$^{cdef}$ | 3.80$^{a}$ | 35.70$^{c}$ | 1.30$^{fgh}$ |
| $T_4$ | Red Round | 9.10$^{b}$ | 6.55$^{b}$ | 3.50$^{def}$ | 3.40$^{abcde}$ | 20.90$^{kl}$ | 2.10$^{ab}$ |
| $T_5$ | COHBT-68 | 7.00$^{defg}$ | 5.10$^{cde}$ | 3.00$^{gh}$ | 3.00$^{cde}$ | 14.00$^{n}$ | 1.50$^{def}$ |
| $T_6$ | COHBT-270 | 7.20$^{cdef}$ | 5.50$^{ced}$ | 4.00b$^{c}$ | 3.40$^{abcde}$ | 22.75$^{j}$ | 1.00$^{i}$ |
| $T_7$ | COHBT -262 | 7.30$^{cde}$ | 4.50$^{def}$ | 1.75$^{i}$ | 1.65$^{f}$ | 3.50$^{op}$ | 1.25$^{gh}$ |
| $T_8$ | COHBT-217 | 6.10$^{efg}$ | 4.00$^{f}$ | 3.55$^{cdef}$ | 3.70$^{ab}$ | 23.50$^{j}$ | 1.75$^{c}$ |
| $T_9$ | COHBT-70 | 5.80$^{fg}$ | 4.00$^{f}$ | 3.20$^{efg}$ | 3.75$^{ab}$ | 38.90$^{b}$ | 2.20$^{ab}$ |
| $T_{10}$ | COHBT-44 | 6.60$^{defg}$ | 4.00$^{f}$ | 3.10$^{fgh}$ | 3.75$^{ab}$ | 26.95$^{fg}$ | 1.40$^{efg}$ |
| $T_{11}$ | Yellow Round | 7.65$^{cd}$ | 5.25$^{cd}$ | 3.00$^{gh}$ | 2.75$^{e}$ | 20.25$^{l}$ | 1.70$^{cd}$ |
| $T_{12}$ | COHBT -198 | 9.75$^{ab}$ | 6.60$^{b}$ | 5.00$^{a}$ | 4.00$^{a}$ | 43.90$^{a}$ | 2.30$^{a}$ |
| $T_{13}$ | COHBT-209 | 6.40$^{efg}$ | 4.75$^{def}$ | 3.70$^{bcd}$ | 4.00$^{a}$ | 34.95$^{c}$ | 1.40$^{efg}$ |
| $T_{14}$ | COHBT -71 | 7.60$^{cd}$ | 4.75$^{def}$ | 3.25$^{defg}$ | 3.10$^{bcde}$ | 15.50$^{m}$ | 1.10$^{hi}$ |
| $T_{15}$ | COHBT -48 | 8.50$^{bc}$ | 5.75$^{bc}$ | 3.30$^{defg}$ | 3.45$^{abcd}$ | 20.85$^{kl}$ | 1.20$^{ghi}$ |
| $T_{16}$ | COHBT-31 | 6.80$^{defg}$ | 4.00$^{f}$ | 2.70$^{h}$ | 2.85$^{de}$ | 21.70$^{k}$ | 1.15$^{hi}$ |
| $T_{17}$ | COHBT-36 | 6.40$^{efg}$ | 4.25$^{ef}$ | 4.05$^{b}$ | 3.55$^{abc}$ | 25.20$^{i}$ | 1.55$^{cde}$ |
| $T_{18}$ | COHBT -199 | 10.64$^{a}$ | 8.75$^{a}$ | 3.60$^{bcde}$ | 3.45$^{abcd}$ | 33.35$^{d}$ | 2.20$^{ab}$ |
| $T_{19}$ | COHBT-208 | 7.60$^{cd}$ | 5.00$^{cde}$ | 3.30$^{defg}$ | 4.00$^{a}$ | 25.55$^{hi}$ | 2.00$^{b}$ |
| $T_{20}$ | COHBT -206 | 6.00$^{efg}$ | 4.00$^{f}$ | 3.35$^{defg}$ | 3.90$^{a}$ | 34.85$^{c}$ | 1.40$^{efg}$ |
| $T_{21}$ | COHBT -191 | 5.60$^{g}$ | 3.00$^{g}$ | 3.20$^{efg}$ | 3.45$^{abcd}$ | 27.65$^{f}$ | 1.50$^{def}$ |
| **Mean** | | 7.30 | 4.90 | 3.38 | 3.42 | 26.08 | 1.58 |
| **S.Em±** | | 0.48 | 0.31 | 0.14 | 0.22 | 0.94 | 0.09 |
| **CD at 5%** | | 1.43 | 0.92 | 0.46 | 0.68 | 2.80 | 0.22 |
| **CV** | | 9.30 | 8.96 | 6.55 | 9.53 | 5.24 | 6.61 |

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