



Evaluation of Tomato Hybrids in Salem District of Tamil Nadu

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ABSTRACT

Tomato is cultivated in an area of 3177 ha in Salem district of Tamil Nadu. The major villages cultivating tomato are Panamarathupatti, Kammalapatti, Thumbalpatti, Mallur and Nalikkalpatti. Most of the farmers are cultivating private tomato hybrids with lesser productivity and more yield loss (up to 30 %) due to diseases like leaf curl, early and late blight and bacterial wilt. Hence, it was proposed to conduct an on farm trial to assess the *per se* performance of tomato hybrids with high yield and multiple disease resistance like TNAU Tomato Hybrid CO4 and Arka Vishesh. A field experiment was conducted at five different locations of Panamarathupatti block of Salem district during *Kharif* 2019 using hybrids IIHR hybrid Arka Vishesh and TNAU Tomato Hybrid CO 4 with Sivam hybrid as control. TNAU Tomato Hybrid CO 4 recorded an average yield of 95 t/ha and Arka Vishesh around 87 t/ha. The private hybrid Sivam recorded a yield of only 62 t/ha. TNAU Tomato Hybrid CO 4 recorded more average number of fruits per cluster (5.5) and higher fruit yield per plant (2.5 kg) as compared to Arka Vishesh with average number of fruits per cluster (4.5) and higher fruit yield per plant (2.25 kg). The seed cost of the private variety grown by the farmer was higher and the hybrids such as TNAU CO4 and IIHR hybrid Arka Vishesh performed better with regard to higher cost benefit ratio (BCR for TNAU Tomato Hybrid CO 4 is 1:3.81 and for Arka Vishesh 1:3.41). The market preference for TNAU Tomato Hybrid CO 4 was comparatively higher due to the large sized fruits with more acidity (0.7%) which enhances the consumer preference in the market.

Key Words: Tomato, Hybrids, TNAU Tomato Hybrid CO 4, Arka Vishesh, Performance.

INTRODUCTION

Tomato (*Solanum Lycopersicon* L.) has acquired the status of world's most popular vegetable crop due to its wider adaptability to various agro climatic conditions (Gupta *et al*, 2015). In Tamil Nadu, tomato is cultivated in an area of 29,000 ha with a production of around one million tonnes and productivity of 30.51 t/ha. Tomato is considered as protective food crop because of having rich in mineral, vitamins and organic acids. It is an important source of lycopene, ascorbic acid and carotene valued for their colour, flavour and antioxidant properties. The increasing consumption of tomato makes it, a high value crop for generating income to the farmers. It is an important crop both

for production and industry point of view, there is a necessity to improve the productivity per unit area to achieve the increased production from a limited land. Generally diverse parents are expected to give high hybrid vigour and it is also often possible to combine desired alleles in regular fashion without waiting for longer term (Shankar *et al*, 2015). Hence, usually hybrids show better fitness and breeding value than their parents. Higher yield and better fruit quality are universally desired (Triveni *et al*, 2017; Vilas *et al*, 2015).

In Salem district, the area under horticultural crops is 39765 ha and area under tomato cultivation was around 3177 ha in the year 2019-20. The major villages cultivating tomato are Panamarathupatti,

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Kammalapatti, Thumbalpatti, Mallur and Nalikkalpatti. Private hybrids are ruling the market. Cost of the seeds of private hybrids is too high but the farmers are forced to get it for cultivation due to the easy availability. Most of the farmers are cultivating private tomato hybrids with lesser productivity. Yield loss due to diseases like leaf curl, early and late blight and bacterial wilt was up to 30 per cent. Hence, an investigation is needed to assess the performance of high yielding tomato hybrids in Salem district.

MATERIALS AND METHODS

The experimental material consisted of three different hybrids of tomato namely, TNAU Tomato hybrid CO 4 (COTH 4), Arka Vishesh and Sivam hybrid. COTH 4 is released from Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore and the special characteristics of COTH 4 is a F1 hybrid of LE 1226 X LE 1249, in which fruits are flat round with thick pericarp (5.84 mm), and the fruits have green shoulder at breaker stage which turns to red colour at ripening. Fruits are borne in clusters of 5-6, with an average fruit weight of 75.3 g. The hybrid has long harvesting period with 20-22 harvests in 150 days with a yield of 2.94 kg/plant. It is having a capacity of yielding 92.3 t/ha (27.31 % increase over TNAU tomato hybrid CO3 and 40.91% over Lakshmi) with ascorbic acid content: 26.13 mg/100 g and TSS: 6.10 brix and titrable acidity: 0.70 per cent.

Arka Vishesh is a F1 hybrid released from Indian Institute of Horticultural Research, Bengaluru and its yield potential is 75-80 t/ha. It is suitable for processing into puree, paste, ketchup, sauce, tomato crush. TSS: 4- 4.6⁰ **Brix**, colour value of crushed tomato juice (a/b, Hunter Lab scale): 1.98-2.12, average fruit weight: 70-75gm, acidity of crushed tomato juice: 0.32-0.36, pH: 4.21-4.41, lycopene content: 8.5-10.5 mg/100g, lycopene content in tomato paste: 14.14 mg/100g, firmness: 4.09-5.41 kg/cm², seed content 0.4 to 0.5 and peel content: 5.96.

Sivam is a private semi determinate hybrid from the Hyveg Company and it is tall determinate to semi determinate plants with good foliage cover and vigour. Days to first harvest are 62-67 days. Flat round fruits with green with very firm structure and acidic taste. Colour of the fruit is deep red with an average weight of 100-120g and have intermediate resistance to tomato leaf curl virus. Shoulder of the fruit is green, mild ribbing with deep oblate shape and it sets fruits up to 38°C.

A field experiment was conducted at different locations of Panamarathupatti block in Salem district during *Kharif* 2020 using hybrids TNAU Tomato Hybrid CO 4 and Arka Vishesh and with Sivam Hybrid as check hybrid. The experiment was laid out in a randomized block design with seven replications. The mean performance of different traits such as plant height, days to first flowering, days to first harvest, number of fruits per cluster, fruit yield per plant, yield per hectare, net returns per hectare and benefit cost ratio have been recorded and data were subjected to statistical analysis (Panse and Sukhatme, 1985).

RESULTS AND DISCUSSION

The data (Table 1.) showed that TNAU Tomato Hybrid CO 4 recorded an average high yield of 95 t/ha and Arka Vishesh around 87 t/ha. The private hybrid Sivam recorded less yield of 62 t/ha. TNAU Tomato Hybrid CO 4 recorded more average number of fruits per cluster (5.5) and higher fruit yield per plant (2.5kg) as compared to Arka Vishesh with an average number of fruits per cluster (4.5) and higher fruit yield per plant (2.25 kg). The size of the fruit was also better in TNAU Tomato Hybrid CO 4 (73.5g of average fruit weight). With regard to precocity in flowering and fruit setting, TNAU Tomato Hybrid CO 4 took around 32 days for first flowering and 36 days for 50 per cent flowering. These results were in resemblance with the findings of Shankar *et al* (2015) and Triveni *et al* (2017).

The seed cost of the private variety grown by the farmer was higher and the hybrids such as

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Table 1. *Per se* performance of TNAU Tomato Hybrid CO 4 and Arka Vishesh, IHR hybrid of tomato in Salem District.

| Treatment | Plant height (cm) | Days to first flowering | Days to 50% flowering | Number of fruits per cluster | Av. fruit wt (g) | Yield per plant (kg) | Yield (t/ha) | Net Returns (lakh/ha) | B:C ratio |
|------------------------|-------------------|-------------------------|-----------------------|------------------------------|------------------|----------------------|--------------|-----------------------|-----------|
| TNAU Tomato Hybrid CO4 | 90 | 32 | 36 | 5.5 | 73.5 | 2.50 | 95 | 3.8 | 3.81 |
| Arka Vishesh | 92 | 33 | 37 | 4.5 | 70.5 | 2.25 | 87 | 3.26 | 3.41 |
| Sivam hybrid | 96 | 35 | 40 | 4.5 | 62.5 | 2.15 | 62 | 2.17 | 2.55 |
| Mean | 93.14 | 33.3 | 37.6 | 5.02 | 68.88 | 2.29 | 81.3 | | |
| CD5% | 1.77 | 1.03 | 0.95 | 0.37 | 0.46 | 0.11 | 1.26 | | |
| CD1% | 2.49 | 1.44 | 1.33 | 0.51 | 0.65 | 0.16 | 1.76 | | |
| SEd | 0.81 | 0.47 | 0.43 | 0.17 | 0.21 | 0.05 | 0.58 | | |
| CV(%) | 1.6 | 2.65 | 2.16 | 6.26 | 0.58 | 4.28 | 1.3 | | |



TNAU Tomato Hybrid CO 4



Arka Vishesh



Sivam Hybrid Tomato



Field view of the Experiment in farmers field

TNAU Tomato Hybrid CO 4 and IIHR hybrid Arka Vishesh performed better with regard to higher cost benefit ratio (BCR for TNAU Tomato Hybrid CO 4 is 1:3.81 and for Arka Vishesh 1:3.41). But the market preference for CO4 was comparatively higher due to the large sized fruits with green shoulder at breaker stage with more acidity (0.7%) which enhances the consumer preference in the market.

In general, it was observed that apart from higher yield in TNAU tomato hybrid CO 4, the consumers preference was more than Arka Vishesh hybrid and hence marketability was also comparatively easier and better in TNAU Tomato Hybrid CO 4 than Arka Vishesh and Sivam Hybrid.

CONCLUSION

In Salem District of Tamil Nadu the TNAU Tomato Hybrid CO 4 recorded higher fruit yield of 95 t/ha with higher benefit cost ratio (3.81) whereas the Arka Vishesh recorded an yield of 87 t/ha with a benefit cost ratio (3.41). Hence, TNAU Tomato Hybrid CO 4 hybrid is found be more suitable for Salem tomato growing farmers to get higher yield in tomato as well as higher net income and benefit cost ratio.

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