



Assessment of Chilli (*Capsicum annum* L.) Hybrids for Growth and Yield Characters

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ABSTRACT

Chilli hybrids are grown on Kamuthi and Paramakudi blocks of Ramanathapuram district on nearly 50 ha area. Assessment of chilli hybrids for growth, yield and higher productivity was conducted at five different farmers' fields during the year 2017-18 under on farm testing. TNAU Co (Ch) 1, Arka Harita, Arka Meghana and local variety were used in this study. The results revealed that TNAU CO (Ch)1 hybrid recorded the highest values for growth, yield and cost economics traits. The growth characters like plant height (49.63 cm), number of fruits/plant (82.50), fruit weight (5.60 g) and fruit length (10.89 cm) observed the highest values in TNAU Co (Ch)1 followed by Arka Harita as (48.50cm; 78.30; 5.31g and 10.19 cm whereas local hybrid recorded the lowest values for all the traits. Arka Harita took the minimum number of days of 50 per cent flowering (43). Regarding yield, TNAU CO (Ch)1 hybrid recorded the highest plant yield (449.20 g) and yield/ha (16.76 t/ha) followed by Arka Harita (413.0 g; 15.47 t/ha) whereas local check recorded the lowest yield of 13.14 t/ha. In the case of benefit cost ratio, CO (Ch)1 recorded the highest ratio of 3.03 with the net profit of 1,34,920 followed by Arka Harita (2.85) whereas local check observed the lowest B:C ratio (2.19) and net profit of Rs. 83,200. TNAU CO (Ch)1 hybrid is performed well and increased yield of 27 per cent with good market preference over the farmers practices. Due to highest yield TNAU CO (Ch)1 was found to be the most suitable chillies hybrid under Ramanathapuram condition.

Key Words : Chillies, On farm testing (OFT), Fruit length, Fruit weight, Yield, B:C ratio.

INTRODUCTION

Chilli (*Capsicum annum* L.) is one of the most important vegetable as well as spice crop, belongs to family Solanaceae. Basically chilli is a crop of tropical and subtropical region. It is a self pollinated crop bearing a pod like fruit (berry) and has a predominant position among the spices grown all over India. India produces about 1.298 MT of chillies from an area of 0.806 M ha with an average productivity of 1611 kg/ha (NCPAH, 2017). In India, chillies are cultivated at Andhra Pradesh, Orissa, Maharashtra, West Bengal, Karnataka, Rajasthan, Uttar Pradesh and Tamil Nadu. Though, it is cultivated in different districts of Tamil Nadu but Vilathikulam and Kovilpatti of Tuticorin district are major producers. In Ramanathapuram district samba chillies were cultivated in Kamuthi block

and cultivated around 30 -50 ha. Private hybrids and local varieties were predominantly cultivated by the farmers and getting low income. Farmers were unaware about new high yielding varieties and technologies. Hence, an assessment on chilli hybrids for growth, yield and higher productivity and its suitability in Ramanathapuram district was carried out.

MATERIALS AND METHODS

The present experiment was conducted at five farmers' fields at Vallanthalai and Korapallam villages of Kamuthi block during *Rabi* season of 2017-18. TNAU CO (Ch)1 seeds were purchased from Horticultural College and Research Institute, TNAU, Coimbatore whereas Arka Harita and Arka Meghana seeds from the Indian Institute of

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Horticultural Research (IIHR), Bengaluru. The field was thoroughly ploughed, well decomposed farmyard manure was applied at the rate of 25t/ha and formed ridges and furrows. The seeds were sown in portraits during 2nd week of September and seedlings were transplanted on 3rd week of October 2017. TNAU CO (Ch)1, Arka Harita, Arka Meghana and local check (farmers practices) were used for this study. The seeds were purchased and distributed to the five identified farmers of Kamuthi blocks and seedlings were transplanted at a spacing of 60 x 45 cm on one side of the ridges. One plot size is 3 x 3 m and 20 cents area was cultivated for each hybrid. The recommended cultivation practices were followed as per the crop production guide, 2014 (Anon, 2014). Recommended dose of 30 t of FYM and NPK 30:80:80 kg/ha were as applied. Basal application of 2/3rd nitrogen and entire P and K and top dressing of 30 kg N / ha in equal splits applied on 30, 60 and 90 days after planting.

Arka vegetable special were purchased and applied as foliar application during 45th, 75th and 90th d after transplanting. Soil application of *Pseudomonas fluorescens* @ 2.5 kg/ha at the time of last ploughing and incorporated and also 10g also used as seed treatment of chilli seeds. Yellow sticky

traps @ 15 numbers per ha were placed in different directions of the plot. Neem oil also purchased and distributed to the farmers to control the insect pest. Before conductance of the experiment, imparted trainings to the farmers on protray nursery raising, nursery management, transplanting of seedlings to the main field, application of growth regulators and harvesting methods etc. In addition to this arka vegetable special and tricontanol booster were also given for foliar spraying to increase the fruit set and quality (Mehraj *et al*, 2014). The observation on plant height (cm), days to 50 per cent flowering (days), number of fruits per plant, average fruit weight (g), average fruit length (cm), yield per plant (g), estimated yield per ha (t/ha), net income (Rs.), B:C ratio and market preference were recorded. The data were analysed with appropriate statistical method was suggested by Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

The results revealed (Table 1) that among the four hybrids of chillies, TNAU CO (Ch) 1 recorded the highest values in growth, yield and cost economics characters than other hybrids. Plant height of 49.63 cm recorded the highest

Table 1. Testing of chilli hybrids for growth and yield characters.

Sr. No.	Particular	TNAU Co (Ch)1	Arka Harita	Arka Meghana	Farmers practice	SEd	CD (P= 0.05%)
1.	Plant height (cm)	49.63	48.50	47.24	46.26	0.034	0.074
2.	Days to 50 per cent flowering (days)	45	43	48	51	0.81	1.68
3.	Days to first harvest	81.58	83.22	84.15	89.85	1.87	2.98
4.	No. of fruits per plant	82.50	78.30	67.50	58.20	1.612	3.513
5.	Average fruit weight (g)	5.60	5.31	5.20	4.94	0.007	0.015
6.	Average fruit length (cm)	10.89	10.19	10.10	10.02	0.003	0.007
7.	Yield per plant (g)	449.20 g	413.00 g	388.90 g	343.52 g	1.679	3.660
8.	Yield per ha (t/ha)	16.76	15.47	13.26	12.83	0.569	1.24
9.	Market preference	Very good	Very good	Good	Good		
10.	Percentage of thrips incidence (%)	15.0	16.25	17.50	25.52		

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in TNAU CO (Ch)1 followed by Arka Harita of 48.50 cm whereas local check recorded the lowest plant of 47.26 cm. In the case of days to 50 per cent flowering, Arka Harita recorded the earliest days taken for flowering (43) followed by TNAU CO (Ch)1 (45), Arka Meghana (48) whereas the longer days taken for flowering was noticed in local check (farmers practices) of 51. This might be due to genetic makeup of varieties. Mishra *et al* (2017) reported that days to 50 per cent flowering in chilli genotypes required 51 to 58 under Allahabad condition.

Regarding yield characters, TNAU CO (Ch)1 observed the highest number of fruits per plant (82.50) followed by Arka Harita (78.30) whereas the local check registered the lowest number of fruits per plant of 68.20. The same trend was noticed for fruit length and fruit weight also. TNAU CO (Ch)1 recorded the highest fruit length (10.89 cm) and fruit weight (5.60g) followed by Arka Harita (10.19 cm; 5.31 g). The local check noticed the lowest values in fruit length (10.02 cm) and fruit weight (4.94 g). Hadora1 *et al*, (2017) stated that Arka Harita recorded the fruit length of 8.77 cm under Bengaluru condition. Kavitha *et al* (2018) reported that demonstrated variety (Lalima) recorded the highest fruit length (9.78 cm) than the farmer's practices at Salem district of Tamil Nadu.

TNAU CO (Ch)1 recorded the highest yield per ha of 16.76 t/ha which was higher than the other hybrids followed by Arka Harita which recorded

the yield of 15.47 t/ha whereas the local check registered the lowest yield of 12.83 t/ha. The same trend was noticed in yield per plant also. TNAU CO (Ch)1 recorded the highest yield per plant of 449.20g followed by Arka Harita (413.0 g) whereas the local check registered the lowest yield per plant of 343.52 g. This is in accordance with the findings of Kavitha *et al* (2018) stated that demonstrated variety (LCA 625) recorded the highest yield of 12.6 t/ha when compared with local check under Salem condition of Tamil Nadu. Demonstrated variety recorded the higher yield than farmers practice in French bean and clusterbean (Muthuramu, 2015; Rajamanickam, 2019). The yield variations were occurred amongst the genotypes, varieties and hybrids under varying field conditions have been reported by Mishra *et al* (2017).

ECONOMICS

The gross cost of cultivation almost similar for three improved varieties but local practice was the lowest gross cost (Table 2). Among the chilli hybrids, market preference was higher for TNAU CO (Ch1) as well as Arka Harita and both the hybrids fetched higher prices. TNAU CO (Ch1) recorded the highest net profit of Rs. 1,34,920/ha with the benefit to cost ratio of 3.03 followed by Arka Harita (Rs. 1,20,530/ha; 2.85) while the local check registered the lowest net profit of Rs. 83,200/-ha and B:C ratio of 2.19. It was found that farmers were convinced with the performance of TNAU CO (Ch1) fetches higher income, higher yield and

Table 2. Cost economics for different chilli hybrids under Ramanathapuram condition.

Sr. No.	Particulars	TNAU Co (Ch)1	Arka Harita	Arka Meghana	Farmers practice
1.	Yield per ha (t/ha)	16.76	15.47	13.26	12.83
2.	Gross cost (Rs.)	66,250	65,100	68,315	69,900
3.	Gross income (Rs.)	2,01,170	1,85,630	1,60,560	1,53,100
4.	Net Profit (Rs.)	1,34,920	1,20,530	92,245	83,200
5.	BCR	3.03	2.85	2.49	2.19

recorded the low incidence of thrips (15.0 %) when compared with local check (25.52 %). TNAU CO (Ch)1 hybrid is performed well and increased yield of 27 per cent with good market preference over the farmers' practices.

CONCLUSION

The present study concluded that cultivating TNAU CO (Ch1) and Arka Harita at Ramanathapuram district was more beneficial due to their yield contributing traits namely number of fruits per plant, fruit length, average fruit weight, yield per plant and yield per hectare which were recorded higher as compared to farmer's choice of variety. TNAU CO (Ch1) fetches higher profit (Rs. 1,34,920/ha) with benefit to cost ratio of 3.03, higher yield (16.67 /ha) and recorded the low incidence of thrips (15.0 %) when compared with local check (25.52 %). TNAU CO (Ch1) performed well and increased yield of 27 per cent with good market preference over the farmers' practices. Hence, Farmers realized that chillies hybrids TNAU CO (Ch1) and Arka Harita were better choice in terms of yield and market under Ramanathapuram condition. These two hybrids will be promoted as frontline Demonstrations and mass demonstration during ensuing season at Ramanathapuram district.

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