

Assessment of Chilli Hybrids for Growth, Yield and Economics at Tiruvallur District of Tamilnadu

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ABSTRACT: Hot pepper or Chilli (*Capsicum annuum* L.) is an important and widely cultivated vegetable and spice crops of India. Assessment of chilli hybrids for growth, yield, economics and higher productivity was conducted in five different farmer's field during the year 2017-2018 at Ellapuram and Ekkadu blocks under on farm trial to know about the performance of chilli hybrids viz., TNAU CO (ch)1 and IHR Arka Harita. Several growth, yield and economical characters of the two hybrids were studied in comparison with the local variety Arani local chilli. The results showed that Arka Harita exhibited the highest values for growth, yield and economic traits. The growth characters like plant height (49.5), number of fruits per plant (81.20), fruit length (10.4 cm), market preference (very good) were observed the highest values in Arka Harita followed by TNAU CO (ch)1 (48.42 cm, 77.8, 10.7 cm and good) whereas local variety recorded the lowest values (44.26 cm, 65.4, 10.0 cm and average). Arka Harita recorded the minimum number of days for 50 per cent flowering (42) and number of days to 1st harvesting of fruits (80.48). Arka Harita recorded the highest number of fruits per plant (81.2) followed by TNAU CO (ch)1 is (77.8) whereas the local variety registered the lowest number of fruits per plant of 65.40. Regarding yield characters, Arka Harita recorded the highest fresh pod yield (29.04 t/ha) and dry pod yield (6.0 t/ha) followed by TNAU CO (ch) 1 (fresh pod 26.6 t/ha and dry pod 5.3 t/ha) whereas local variety recorded the lowest yield of 18.8 t/ha as fresh pod yield and 1.8 t/ha as dry pod yield. With respect to benefit cost ratio, Arka Harita recorded the highest ratio of fresh pod (3.05) and dry pod (5.58) with the net profit of fresh pod (Rs.2,34,487) and dry pod (Rs. 5,21,897) followed by TNAU CO (ch) 1 of fresh pod (2.76) and dry pod (5.08) with the net profit of fresh pod (Rs.1,95,781) and dry pod (Rs. 4,40,486) respectively, whereas local variety observed the lowest BC ratio (fresh pod 1.82; dry pod 1.52) and net profit for (fresh pod Rs.97,177; dry pod Rs. 59,559). Thrips incidence was low in Arka Harita (25.4 per cent) when compare to local variety (16.4 per cent). Arka Harita recorded higher technology gap (2.96 t/ha), extension gap (10.2 t/ha) and harvest index (10.1 per cent), compare to local variety and also showed high parentage yield increase over local type and recorded 54.10 per cent increase yield.

Keywords: Chilli, *Capsicum annuum*, Hybrids, On Farm Trial, Growth, Yield.

INTRODUCTION

Chilli (*Capsicum annuum* L.) is one of the most valuable spice crops in India. The crop is grown largely for its fruit. It is an indispensable spice essentially used in every Indian cuisine due to its pungency, spice, taste

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and appearing odour and flavour. Chilli fruits are rich source of vitamins viz., A, C and E. (Ngullie and Biswas 2016). India produces about 1.298 million metric tonnes of chillies from an area of 0.806 ha with average productivity of 1611 kg/ha. Chilli contributes

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about 33 per cent of the total spice export from India and holds for about 16 per cent share of the world spice trade Gogoi *et al.* (2021); Malathi *et al.* (2023).

In Tiruvallur district, farmers are mainly concentrating on the private varieties/hybrids and local varieties/types for their cultivation practices. The majority of the farmers in this block are do not follow any scientific cultivation aspects and only few of them use the high yielding varieties in their farming practices. The crop is more popular in this district, but due to insufficient knowledge regarding improved hybrids and management practices, the productivity of chilli is facing a barrier to reach its maximum price in export markets. Keeping these considerations in views, the present study was carried out with an objective to assess the growth, yield, economics and extension tools (technology gap, extension gap, technology index) of chilli hybrids.

MATERIALS AND METHOD

The study on assessment of chilli hybrids IHR Arka Harita and TNAU CO (ch)1 was carried out at farmers filed in five locations of Tiruvallur district *viz.*, Ellapuram and Ekkadu blocks during 2017 – 2018. Arka Harita seeds were purchased from IHR, Bengaluru, whereas TNAU CO (ch)1 seeds were purchased from HC and RI, TNAU, Coimbatore. The technical intervention taken up in the study were as follows: seed rate @ 200g/ha, spacing 75 × 65 cm, sowing time September, FYM @ 30 t/ha and NPK @ 60:80:80 NPK kg/ha. Cultural and agronomic practices were followed as per the standard recommendations and need based plant protection measures were taken up to maintain healthy crop stand. Before conducting the experiment, trainings were given to the chilli farmers regarding seed treatments, protray nursery raising and their management, transplanting of seedlings to main field, fertilizer application, pest and disease management, quality improvement etc. Data on output of chilli cultivation as well as local practices commonly adopted by the farmers were collected. The observations on plant height, days 50 per cent flowering, days taken to 1st harvest, number of fruits/plant, fruit length (cm), cost of economics, market preference, thrips incidence, increase yield over farmers practice, technology gap, extension gap and technology index were recorded. The extension tools were workout using the formulae (Samui *et al.*, 2000) as given below.

Technology gap = Potential Yield - Demonstration Yield

Extension gap = Demonstration Yield - Farmer's Practice Yield

Technology Index = $\frac{\text{Potential yield} - \text{Demonstration Yield}}{\text{Potential Yield}} \times 100$

Increase % over Farmers practice = $\frac{(\text{Demonstration Yield} - \text{Farmer's Practice Yield})}{\text{Farmer's Practice Yield}} \times 100$.

RESULT AND DISCUSSION

The results revealed that (Table 1) Arka Harita exhibited the highest values for growth, yield,

economic traits and extension tools (Technology gap, Extension gap and Technology Index). The highest Plant height of 49.5 cm was recorded by Arka Harita and it was followed by TNAU CO (ch)1 (48.42 cm) whereas local check recorded the lowest plant height of 44.26 cm.

In the case of days to 50 per cent flowering Arka Harita recorded the earliest days for flowering (42) and it was followed by TNAU CO (ch)1 (44). Whereas, the longer days taken for flowering was noticed in local Arani variety (48 days). Similarly, Arka Harita recorded the earliest (80.48) for days taken to first harvest, and it was followed by TNAU CO (ch)1 (82.2) whereas the longer days taken to 1st harvest was noticed in local variety (88.65 days). This might be due to different genetic makeup of both the varieties. Similar results were reported by Patil *et al.* (2012); Saravaiya *et al.* (2011); Rajamanickam (2020). Mishra *et al.* (2017) reported that days taken to 50 per cent flowering in chilli genotypes required 51 to 58 days under Allahabad condition. Similar type of trend was observed regarding the yield characters also.

In the present study, it was revealed that Arka Harita observed the highest number of fruits per plant (81.2) and it was followed by TNAU CO (ch)1 (77.8). Whereas, the local check registered the lowest number of fruits per plant (65.40).

Regarding yield characters, Arka Harita recorded the highest fresh and dry pod yield (29.04 t/ha; 6.0 t/ha) and it was followed by TNAU CO (ch)1 (26.6 t/ha; 5.3 t/ha), whereas the local check registered the lowest yield of 18.8 t/ha fresh pod and 1.8 t/ha dry pod. Higher fruit weight might be attributed by higher fruit length and fruit width. Similar results were reported by Mantano and Cedeno (2002); Kavitha *et al.* (2018); Rajamanickam (2020); Verma *et al.* (2020); Malathi *et al.* (2023).

Arka Harita recorded higher BCR of fresh and dry pod (3.05; 5.58) with the net profit of fresh and dry pod (Rs.2, 34,487; Rs. 5, 21,897) followed by TNAU CO (ch)1 which recorded BCR of fresh and dry pod (2.76;5.08) with net profit of Rs. 1,95,781 and Rs. 4,40,486 respectively. Whereas, local variety registered the lowest BCR for fresh and dry pods (1.82; 1.52) with net profit for fresh and dry pod (Rs. 97, 781; Rs. 59,559). This might be due to high individual fruit weight and yield potential governed by the genetic makeup of improved varieties.

From the Table 2, it was observed that Arka Harita hybrid recorded higher technology gap (2.96 t/ha), extension gap (10.20 t/ha) and technology index (10.10 %) compare to local variety. Similar results were also reported by Devi *et al.* (2020); Malathi *et al.* (2023). The increased growth, yield and economics observed might be due to the improved chilli hybrid, improved production technology and timely cultural operations followed in the on farm demonstration trials.

This result was in accordance with Singha *et al.* (2020); Malathi *et al.* (2023). The percentage increase over farmers practice was 54.10 per cent indicating the superiority over check with respect to yield characters.

Table 1: Performance of Chilli hybrids under Tiruvallur condition.

Technology	Plant height (cm)	Days to 50 per cent flowering	No. of fruits /plant	Days to 1 st harvest	Fruit length (cm)	Market preference	Thrips incidence (Per cent)
Farmers Practice Arani local	44.26	48	65.4	88.65	10.0	Good	25.4
TNAU COCH-1 Chillies	48.42	44	77.8	82.22	10.7	Good	17.2
IIHR Arka Harita Chillies	49.54	42	81.20	80.48	4	Very good	16.4

Table 2: Yield and cost of economics of Chilli hybrids.

Technology	Yield		Net returns		BC ratio	
	Fresh pod (t/ha)	Dry pod (t/ha)	Fresh pod	dry pod	Fresh pod	dry pod
Farmers Practice Arani local	18.84	1.82	97,177	59,559	1.82	1.52
TNAU COCH-1 Chillies	26.26	5.31	195,781	440,486	2.76	5.08
IIHR Arka Harita Chillies	29.04	6.04	234,487	521,897	3.05	5.58

Table 3: Yield gap and yield index analysis of Chilli hybrids.

Technology	Potential yield (t/ha)	Increase per cent over farmers practice	Technology gap (t/ha)	Extension gap (t/ha)	Technology index (per cent)
Farmers Practice Arani local	-	-	-	-	-
TNAU COCH-1 Chillies	28	39.5	1.74	7.42	6.6
IIHR Arka Harita Chillies	32	54.1	2.96	10.2	10.1

CONCLUSIONS

From the present study it was concluded that the chilli hybrid Arka Harita recorded higher yield and return than the local arani chilli at tiruvallur district which can uplift the economical status of the farming community. After the technological interventions farmers realized that Arka Harita a better choice interms of yield, returns and very good market preference under tiruvallur condition. Arka Harita hybrid will be promoted as FLD and mass demo during ensuing season at tiruvallur district of Tamil nadu.

FUTURE SCOPE

The current investigation provided the information regarding the Arka Harita hybrid will be promoted as FLD and mass demonstration during ensuing season at tiruvallur district of Tamil nadu and is suitable for chilli growing farmers of tiruvallur district to get higher yield as well as higher net income and benefit cost ratio in chilli.

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Conflict of Interest. None.

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