International Journal of Allied Sciences July-December: 10 (2) 24-27,2025
Peer reviewed.

IMPACT OF STAKING TECHNOLOGY IN FRONT-LINE DEMONSTRATIONS ON YIELD AND ECONOMIC FEASIBILITY OF TOMATO IN SULTANPUR (UTTAR PRADESH)

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ABSTRACT: Tomato is a major vegetable crop grown in Sultanpur district of Uttar Pradesh with the major constraints of low productivity & profitability of tomato by the growers. The study was undertaken by KVK Sultanpur to address the Staking tomato method, yield gap through both practices on tomato crop with 20 demonstrations on tomato crop since 2023-24 to 2024-25 in the districts. It was observed that the average yield of 725.00 q/ha was obtained in demonstrated plot over control (528.50 q/ha) with the increasing the average productivity by 37.17 per cent. The extension gap and technology gap ranged between 190.00 to 203.00 and 210.00 to 190.00 q/ha, respectively, with the technology index of 21.62 per cent during the demonstration years. The demonstrated plots gave higher gross return (Rs. 6,16,250), net return (Rs. 4,32,752.50) with higher benefit cost ratio (2.38%) compared to farmer's practice.
Key words: Staking Tomato, Yield, Extension gap, Technology gap, Technology index and B:C ratio.

INTRODUCTION

Tomato is the most important vegetable crops of the world, and it is the most consumed vegetable in India. Tomato is a major commercial vegetable crop in Sultanpur district, cultivated in an area of 215 ha with a production of 47,925 qt/ha and productivity of 225 qt/ ha. With the increasing human population in recent years, land scarcity, and high food demand to attain food security, marginal lands such as staking tomato technology should be exploited. Staking tomato plants involves driving a stake into the ground and tying the plant to it for support, which keeps fruit off the ground, improves airflow, and prevents disease. To stake, push the stake about a foot into the soil near the plant, then tie the main stem to it with soft material like twine or strips of fabric. Staking tomatoes provides support to help keep plants off the ground while assisting in their upward growth habit. Because of many diseases and insects start at the ground level, using a structured system to keep them away from ground contact is prudent. Farmers are facing the low market prices, poor quality & low production of fruit due to lack of staking technology. Keeping in view demonstrations were conducted for getting quality fruit, better productivity with profitability.

MATERIAL AND METHODS

In two years from 2023-24 to 2024-25, Staking tomato trials were conducted in 20 sites in 20 farmer's fields at Sultanpur district by ICAR-Krishi Vigyan Kendra, Sultanpur (U.P.). Each demonstration was conducted on 0.2 ha area while farmer's practice was considered as control plot. Krishi Vigyan Kendra have provided some Staking material as a critical input as yellow sticky cards, pheromone traps, training of recommended package of practices, field day and exposure visit also conducted at farmers field with neighbouring villages. The data on production cost and returns were collected by KVK with frequent field visits during 2023-24 to 2024-25 from demonstration plots and farmers practice plot. The extension gap, technology gap, and technology index were calculated as given by (Samui et al.,2000).

Per cent (%) increase in yield = Demonstration yield - farmers practice yield X 100 / Farmers practice yield

Technology gap = Potential yield -Demonstration yield

Extension gap = Demonstration yield - Yield under existing practice

Technology index = Potential yield - Demonstration yield X 100 / Potential yield

III. RESULTS AND DISCUSSION

A. Yield

Table- 1: The observations on Yield (q. /ha), Increased in yield (%), Potential Yield (q/ha),

Year	Area (ha)	No. of FLDs	Demonstration Yield (q/ha)			Farmer's practice Yield(q/ha)	Increased in yield (%)	Potential Yield (q/ha)
			Highest	Lowest	Average			
2023-24	0.2	15	805	625	715	525	36.19	925
2024-25	0.2	15	825	645	735	532	38.15	925

Average	-	-	-	-	725	528.5	37.17	925

The analysis of primary data revealed that the yield ranged from 715.00 q/ ha to 735.00 q/ ha with average yield of 532.00 q/ ha in demonstration plots compared to 525.00 q/ ha to 532.00 q/ ha with average yield of 528.50 q/ ha in farmer's practice plots in same years. The data clearly indicated that the higher average yield in demonstration plots over the years compare to farmers practice due to staking of tomato i.e., use of use of yellow sticky cards, pheromone traps and training of recommended package of practices. The average yield of tomato increased by 37.17 per cent. The above findings are in similarity with the findings of (*Balai et al.,2013*) and (*Singh et al.,2011*). The increment in yield ranged between 36.19 to 38.15 per cent.

B. Extension gap

Table -2: Technology gap, technology index and extension gap in staking tomato production under Demonstration

Years	Extension gap (q/ha)	Technology gap (q/ha)	Technology index (%)
2023-24	190	210	22.70
2024-25	203	190	20.54
Average	196.5	200	21.62

Table 2 shows that Extension gap of 190.00 and 203.00 q/ha with an average extension gap 196.5 q/ha were observed during 2023-24, 2024-25 respectively. The result emphasized that need to aware the farmers through techniques like staking tomato for the adoption & bridge the wide extension gap. More use of latest production technologies with high yielding variety will subsequently change this alarming trend of galloping extension gap (*Teggelli et al.,2015*).

C. Technology gap

Table 2 shows that the technology gap of 210.00 and 190.00 q/ha with an average extension gap 200.00 q/ha were observed during 2023-24, 2024-25 respectively. It is due to the staking tomato technology, management skills of individual farmer's and sticky and pheromone etc. Hence, location specific recommendations are necessary to bridge this gap (*Singh et al.,2011*).

D. Technology Index

Table 2 shows that the technology index of the demonstrated technology at the farmer's field. Table 2 shows that the technology index varied from 22.70 to 20.54 with an average technology index of 21.62 per cent was observed during the 2023-24, 2024-25 respectively. It shows that the technical interventions of staking tomato to increase the yield of tomato.

E. Economic returns

Table- 3: Comparative economics of staking tomato production under Demonstration

Years	Cost of Cultivation (Rs. /ha)		Gross Return (Rs. /ha)		Net Return (Rs. /ha)		B:C Ratio	
Year	Demonstration	Farmers practice	Demo.	Farmers practice	Demo.	Farmers practice	Demo.	Farmers practice
2023-24	1,82,000	1,85,000	6,07,750	4,46,250	4,25,755	2,61,250	3.30	2.41
2024-25	1,85,000	1,88,000	6,24,750	4,52,200	4,39,750	2,62,200	3.38	2.36
Average	1,86,500	1,86,000	6,16,250	4,49,225	4,32,752.50	2,61,725	3.34	2.38

The yield recorded was significantly higher of staking tomato technology in comparison to r farmer's practice. Av. gross return were Rs.6,16,250 in comparison of Rs. 4,49,225 of farmer's practice, Av. Net return were Rs. 4,32,752.50 in comparison of Rs. 2,61,725 of farmer's practice, and the B: C ratio was significantly higher in staking tomato 3.34 than non-staking tomato 2.38 in the year 2023-24 and 2024-25 respectively. This may be due to higher yield obtained and lower cost of cultivation under staking tomato technology compared to farmer's practice. The results corelate with finding of (*Singh et al.,2011*).

IV. CONCLUSIONS

It is concluded that the practice of staking tomato was found to be better with 37.17 % increase in yield and B:C Ratio was 3.34. Thus, to enhance the tomato production & Productivity with staking technology practice be adopted. The access economic feasibility revealed that staking technology in tomato gave higher net return 4,32,750.50 in comparison to farmer practices2,61,725.00 per ha. The productivity of staking tomato cultivation has created greater awareness and motivated other farmers to adopt the demonstrated technology for tomato production in the district. The above facts are acknowledged necessity of staking technology in tomato production. However, further research work needs to be undertaken to clarify the staking technology.

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