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Effect of front-line demonstration on yield of brinjal and socio-economic status of the farmers

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Abstract
Krishi Vigyan Kendra, Madurai was conducted the Front Line Demonstrations (FLDs') in the twenty farmer's field. Lack of improved varieties and conventional farming leads to lesser yield and economics. To overcome these problems, the FLDs' was done in the farmers fields of Lekkadipatti village, Kottampatti Block and Nedungulam village, Thruparangundrum Block during 2021-2022 and 2022-23. The farmers realized very good fruit (Brinjal VRM 1) yield (17.325 t/acre) in brinjal and could sell the produce @ Rs 36 per kg in nearby market and got gross income of Rs. 6,23,700/-. He is observed the performance of IIHR Vegetable Special in terms of better fruit size, fruit weight yield and net income. They earned additional income of Rs. 90,036/- from five months crop duration by applying vegetable special foliar spray. Whereas the conventional farming ie. Farmers practice average yield was 14.824 t/acre and got gross income of Rs. 5,33,664/-. The percentage increase over farmers practice is 16.9. IIHR Vegetable Special can give continuous flowering and fruiting. The recommended dosage of foliar application of Arka Vegetable Special @ 75 grams in 15 liters of water (5 grams per litre) along with 1 shampoo sachet and lemons has been practiced for four times in the field. It also helps in retaining more number of flowers, thus increase in the fruit set leading to higher yield Now farmers are using IIHR vegetable special regularly for all the vegetable crops as he has noticed enhancement effect on yield and fruit quality particularly in brinjal. The farmers were experienced the effectiveness of the technologies in the field and got sustainable yield and income.

Keywords: Brinjal, vegetable special foliar spray, yield, economics, impact assessment

Introduction
Brinjal (*Solanum melongena* L.) is an vital and native vegetable crop of India. It contributes 9.1% of the total vegetable production of the country. It is due to enhancement in production technology, safeguard measures and the hereditary improvement which has shown enhancement in yield, quality, diseases and pest resistance. Standardization of cultural practices, irrigation and nutritional requirements of different cultivars under different soils and climatic conditions helps in betterment of crop stand as reported by Sidhu & Dhatt (2007) [9]. The use of herbicides and mulching practices suppressed the weeds. The water use efficiency has been increased by 66% using drip irrigation technologies. Protected cultivation makes the availability of brinjal during off-season and proved to be effective for borer free fruits. The present research work conducted to find out the effect of micronutrients on growth, yield, and quality of Brinjal (*Solanum melongena* L.) under open field condition. This study suggests that foliar application micronutrients especially during flowering stage is the most effective strategy for improving the yield and quality of fruits and will help to reduce malnutrition reported by Afrin *et al*. (2024) [1].

Materials and Methods
The present study was carried out in Krishi Vigyan Kendra, Agricultural College and Research Institute, Madurai during *Kharif* season. Ten farmers each village were selected in Lekkadipatti and Nedungulam villages, Kottampatti and Thiruparangundrum blocks of Madurai district during 2021-2022 and 2022-23. The recommended dosage of foliar application of Arka

Vegetable Special @ 75 grams in 15 liters of water (5 grams per litre) along with 1 shampoo sachet and lemons has been practiced for four times in the field. The various aspects included in the frontline demonstration were introduction of improved variety, integrated nutrient management, integrated weed management, scheduling of irrigation, integrated pest management and harvesting and post harvest technologies. Yield and economics data *viz*., cost of cultivation, gross return, net return and benefit cost ratio (B: C ratio) were collected from farmer's practices and improved practices and analyzed. The yield and economics data of crop was collected from the benefited farmers through personnel interview. Based on the market price the cost of cultivation and economics were calculated. The technology gap, extension gap and technology index were calculated by the formulae as recommended by Kadian *et al*. (1997) [3], Samui *et al*. (2000) [7].

% increased over farmers practices = Improved practices (IP) – Farmers practices (FP) / farmers practices (FP) x 100

Technology index = Potential Yield – Demonstration Yield/ Potential Yield x 100

Technology gap = Potential Yield - Demonstration Yield

Extension gap = Demonstration yield – Yield under Farmers Practices

B: C ratio = Gross income (Rs. / ha) / Gross cost (Rs. / ha)

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Results and Discussion

Yield

The average yield of brinjal under improved practices was 17.325 t/ha during 2021-22 and 17.521 t/ha during 2022-23. The yield was much higher than compared to that of farmer's practices which was only 14.824 t/ha during 20221-22 and 14.892 q/ha during 2022-23. The average percentage of increase in the yield over farmer's practices was 16.9% and 17.7% respectively during 2021-22 and 2022-23. The results indicated that the Frontline Demonstration gives better impact on farming community of Madurai district by higher productivity due to adopting new improved package of practices shown by Santhosha *et al*. (2021) [8]; Ancy & Kurien (2000) [2].

Extension Gap (EG)

The average extension gap in the improved practices was 25.01 q/ac during 2021-22 and 26.29 q/ac during 2022-23. This gap shows that there is need to educate the farming community about the improved crop management techniques. There is also need to educate the farmers about new high yielding varieties to replace the low yielding local or old varieties. This will increase the yield per capita and overcome the extension gap (Table 1) as shown by Nazreen Hasson (2019) [6].

Technology Gap (TG)

The average technology gap in the improved technology was found to be 6.75 q/ha during 2021-22 and 4.79 q/ha during 2022-23. This technological yield gaps may be endorsed due to variation in soil fertility and specific management practices as reported by Yadav *et al*. (2020) [10], Nazreen Hasson (2019) [6] and Meena & Singh (2016) [4].

Technology Index (TI)

The technology index shows the feasibility of the evolved technology at the farmer's field and the lower the value of technology index more is the feasibility of the technology. The technology index was found to be 3.75 percent during 2021-22 and 2.66 in 2022-2023 of this study as shown by Nazreen Hasson (2019) [6], Nallathambi *et al*. (2012) [5]

Economic Return (ER)

The inputs and outputs prices of produce prevailed during the study of demonstration were taken for calculating cost of cultivation, gross return, net return and benefit: cost ratio (Table 2). The demonstration of brinjal under improved practices gave higher net return and

B: C ratio of Rs. 408686/- and 2.90 during 2021-22 and of Rs. 431066/- net returns and 3.16 B:C ratio during 2022-23. This might be due to higher yield obtained from improved technology as compared to farmer's practices

Table 1: Technology index, technology gap and extension gap of Brinjal

Crop	Variety	Planting method	Area (ha)	Yield (t/ha)		Increase over FP	Technology index (%)	Technology gap (q/ac)	Extension gap (q/ac)
				IP	FP				
2021-22									
Brinjal	VRM 1	Line Planting	4	17.325	14.824	16.9	3.75	6.75	25.01
2022-23									
Brinjal	VRM 1	Line Planting	4	17.521	14.892	17.7	2.66	4.79	26.29

Table 2: Economic impact of the demonstration

Economics of demonstration (Rs./ha)				Economics of check (Rs./ha)			
Gross Cost	Gross Return	Net Return	BCR (R/C)	Gross Cost	Gross Return	Net Return	BCR (R/C)
2021-22							
215014	623700	408686	2.90	220114	533664	313550	2.42
2022-23							
199690	630756	431066	3.16	219458	536112	316654	2.44

Table 3: FLD farmer's details and economic analysis of Brinjal (2021-22)

S No.	Name of Farmer	Village	Dist.	Variety	Crop	Area (ha)	IP Yield (q/ha)	FP Yield (q/ha)	Net Income (Rs/ha)	B:C Ratio	IOFP (%)
1	Ramasamy	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	17.465	15.014	413726	2.92	16.5
2	Periasamy	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	18.425	14.963	448150	3.08	17.4
3	Harish	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	16.800	14.854	389783	2.81	15.8
4	Muthusamy	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	18.056	14.954	434988	3.02	17.1
5	Vasudev	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	17.321	15.023	409656	2.92	16.3
6	Karuppiah	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	17.210	14.758	404610	2.88	16.2
7	Ramaiah	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	17.270	14.651	406668	2.89	16.3
8	Rajesh	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	16.220	14.235	368905	2.72	15.2
9	Maikkam	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	17.365	14.956	410120	2.91	16.4
10	Nallamuthu	Lekkadipatti	Madurai	VRM 1	Brinjal	0.4	17.120	14.836	401285	2.87	16.1
	Total Average						17.325	14.824	408686	2.90	16.9

Table 4: FLD farmer's details and economic analysis of Brinjal (2022-23)

S No.	Name of Farmer	Village	Dist.	Variety	Crop	Area (ha)	IP Yield (t/ha)	FP Yield (q/ha)	Net Income (Rs/ha)	B:C Ratio	IOFP (%)
1	Nallakannu	Nedungulam	Madurai	VRM 1	Brinjal	0.4	17.480	14.835	425897	3.39	17.8
2	Muthusamy	Nedungulam	Madurai	VRM 1	Brinjal	0.4	17.456	14.854	447825	2.89	17.5
3	Periasamy	Nedungulam	Madurai	VRM 1	Brinjal	0.4	17.625	15.124	485054	3.33	16.5
4	Karuppasamy	Nedungulam	Madurai	VRM 1	Brinjal	0.4	17.458	14.954	434668	3.49	16.7
5	Vellaisamy	Nedungulam	Madurai	VRM 1	Brinjal	0.4	17.254	15.462	409336	2.64	11.6
6	Karuppiah	Nedungulam	Madurai	VRM 1	Brinjal	0.4	16.954	14.758	404290	2.55	14.9
7	Kandasamy	Nedungulam	Madurai	VRM 1	Brinjal	0.4	16.987	14.655	406114	2.85	15.9
8	Nallakannu	Nedungulam	Madurai	VRM 1	Brinjal	0.4	17.953	14.533	402563	3.21	23.5
9	Ramasamy	Nedungulam	Madurai	VRM 1	Brinjal	0.4	17.850	14.968	431048	3.44	19.3
10	Karmegam	Nedungulam	Madurai	VRM 1	Brinjal	0.4	18.210	14.769	464012	3.70	23.3
	Total Average						17.521	14.892	431066	3.16	17.7

Conclusion

Based on the findings, it can be accomplished that use of good agricultural practices of cultivation under cluster front line demonstration (CFLD) programme on large scale reduced the technological gap thus it will leads to increased productivity. Moreover, Krishi Vigyan Kendra (KVK), Non Governmental Organization (NGO) and Agriculture Technology Management Agency (ATMA) are the extension agencies which will provide more technical support and guidance to the farmers through method demonstrations, training programmes', exposure visits' to other successful farmers fields and field days which will increased the horizontal spread of the technology to more number of farmers besides the improvement of livelihood of the farmers.

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