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Integrated Crop Management Practices on Yield and Economics of Brinjal at Tiruvallur District of Tamil Nadu, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present study highlights the Integrated crop management in brinjalfor their yield and economics. A field experiments was in tiruvallur district of ICAR-Krishi Vigyan Kendra during 2017-2018. The implementation of scientific technology through optimal resource utilization is the primary driver for horticulture's development. Due to a lack of acceptance of cutting-edge technologies, low production is one of the main obstacles facing conventional brinjal cultivation. Frontline demonstration's primary goals were to persuade farmers to adopt brinjal production technologies in order to facilitate the wider spread of newly released crop production, protection, and management practices in their fields and farming situations, as well as to demonstrate these technologies in action. To increase the production, productivity and quality of agricultural produce, front line demonstrations are being conducted at various farmer's field. There was significantly increased in brinjal yield (36.7 per cent), net return and B:C ratio after conduct of frontline demonstrations as compared to farmers practice. The adoption and implementation of integrated crop management practices through FLD programme, showed positive impact on brinjal growth, yield and economics.

Demonstration plot recorded higher technology gap (22.0 t/ha), extension gap (6.0 t/ha) and technology index (36.6 per cent), compare to local variety and also showed high percentage yield increase over farmer's practice and recorded 20 per cent increase yield means technology was accepted by the farmers.As a result, 50 farmers initiated the small scale farming of brinjal in the district with the technical guidance provided from ICAR-KVK, Tirur, Tiruvallur. Therefore, a study on effect of integrated crop management practices on yield and economics of Brinjal in Tiruvallur district of tamilnadu was conducted during 2017-18.

Keywords: ICM; brinjal; front line demonstration; yield; economic; brinjal production; crop management.

1. INTRODUCTION

"Increasing population and decreasing cultivable area conduced the production of food produces to be year around with high productivity, irrespective of season. In India, a wide climate diversity with peak summer and long monsoon period, it is not possible to get higher yield in all seasons. Eggplant or Brinjal (*Solanum melongena* L.) is one of the important vegetable crops coveringlargest area, production and plays an important role in total vegetable productions in India. Tamil Nadu is well suited for growing varieties of vegetable crops especially brinjal. In India, the significant vegetable crop brinjal (*Solanum melongena* L.) is grown over an area of 7.43 lakh hectares and produces 128.01 lakh tonnes with a productivity of 17.50 t/ha" Chaturvedi et al. [1].

"In tiruvallur district, brinjal is grown throughout the year, providing farmers with significant profits and returns. The brinjal's shoot and fruit borer has developed a very serious problem in this district recently, resulting in a significant yield loss upto40%. ICAR-KVK, Tirur, Tiruvallur conducted integrated crop management on brinjal yield and economics through frontLine demonstration at farmers' field" [2].

The main objective of frontline demonstration was to demonstrate newly released crop production, protection technologies and its management practices at the farmer's fieldlevel under different farming situations and also convincing farmers about the brinjal production technologies for further wide scale diffusion and spreading of technology.

2. MATERIALS AND METHODS

The brinjal crop (variety: COBH-2) was the subject of front-line demonstrations in ten villages in the Tiruvallur region of Tamilnadu in 2017–18. Farmers received the necessary inputs and used them in accordance with the brinjal crop package of techniques suggested by Tamil Nadu Agricultural University, Coimbatore. Prior to conducting FLDs, a list of farmers was compiled from group meetings, and the progressive farmers who were chosen were given specialized skill training on several facets of brinjal growing. Inputs like IIHR Arka Vegetable Special, *Pseudomonas fluoresences*, Wota – T traps and yellow sticky traps were purchased and distributed to the 25 identified farmers. Foliar spray of IIHR Arka Vegetable Special @ 3g per 1 litre of water was applied during critical periods like pre flowering, flowering and fruit

development stages. Yellow sticky traps @ 15 numbers per acre were placed in different directions of the plot. Wota – T traps @ five numbers per acre were placed at different directions of the demonstrated plot to control the shoot and fruit borer moths.

Table 1. Demonstrated package of practices and farmer's practice for ICM in brinjal of Tiruvallur district of Tamil nadu

S.no.	Particulars	Technological interventions	Farmers Practice (Local check)
1	Selection of high yielding hybrid	COBH-2 Brinjal – Moderately tolerant to shoot and fruit borer hybrid	Local or unknown private hybrid/variety
2	Seed rate	200 g/ ha	300 g/ha
3	Seed treatment	Seed treated with *Pseudomonas fluorescens* @ 4 g per kg of seeds.	Not known
4	Raising the seedlings in nursery	Pro-tray method	Traditional method – flat bed method
5	Spacing	60 cm x 60 cm	45 cm x 60 cm
6	Season	Rabi (October to February)	No specific season
7	Application of farm yard manure	Applied farmyard manure@ 25 t/ha at the time ploughing and incorporated into the soil.	Applied farmyard manure three tractor load during ploughing and ridges and furrow preparation for transplanting
8	Application of recommended dose of fertilizer	After transplanting, applied 100 kg N + 150 kg P_2O_5 + 100 kg K_2O per ha along with 2 kg each of *Azospirillum* and *Phosphobacteria*	After transplanting, applied 19:19:19 NPK complex fertilizers or 20:20:0 NPK mixed chemical fertilizer 2- 3 times during cropping period
9	Application of Vegetable Special	Foliar spray of IIHR Vegetable Special @ 5 g + 1 litre of water + 1 shampoo at vegetative stage, flowering and fruit development stages	Not applied any micro-nutrients spray
10	Irrigation	Furrow method of irrigation	Furrow method
11	Plant protection measures for control of insect pest and diseases	Need based application of plant protection like bio-pesticides and chemicals for control: 1. Sucking pests like Aphids: Yellow Sticky Traps @ 15 numbers per acre 2. Shoot and Fruit Borer: Apply neemcake @ 250 kg/ha and Wota – T traps @ five numbers per acre, spraying Quinolphos 1.5 ml per litre of water 3.*Cercospora* Leaf Spot &*Alterneria*Leaf Spot– spraying of 1 % Bordeaux mixture 4. Damping off- Coresin 2 g per kg 5.TMV– Dimethoate 2 ml per litre of water	Not followed, Indiscriminate Spraying of pesticides and fungicides without knowing compatibility of chemicals and not identified pest and disease for spraying.
12	Harvesting	Manual	Manual

Use of high-quality seeds of the improved variety obtained from TNAU, Coimbatore were sowed in nurseries and transplanted in raised beds with the use of inorganic and organic manure in demonstration plots. The output data were gathered from demonstration plots and control plots and then the extension gap, technology gap, and technology index; demonstration economics, as well as the benefit cost ratio, were calculated. The shown trials were continuously observed and all relevant information regarding the essential characteristics of the new types was gathered.

Information on demonstrated package of practices and farmers practices followed as mentioned in Table 1. "Data collected on potential yield of the brinjal in a given situation. Besides this, demonstrated plot yield was obtained using the data from frontline demonstrations conducted in the farmer's field under the close supervision of scientists from ICAR-KVK, Tiruvallur in Soranjeri village. Further, information on actual yield obtained by the farmers on their farms under their own management practices was collected" [2]. The extension tools were workout using the formulae Samui et al. [3] and Dayanand et al. [4] as given below.

Technology gap = Potential Yield - Demonstration Yield

Extension gap = Demonstration Yield -Farmer's Practice Yield

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

Increase % over Farmers practice= {(Demonstration Yield-Farmer's Practice Yield)/Farmer's Practice Yield} x 100

The sum of the costs for labour, irrigation, plant protection measures, seed, manure, and soil preparation was used to compute the overall cost of cultivation.

3. RESULTS AND DISCUSSION

Brinjals have a potential yield of 60.0 t/ha; frontline demonstrations produced a demonstration plot yield of 38.0 t/ha. In comparison to local varieties, the demonstration plot revealed larger technology gaps (22.0 t/ha), extension gaps (6.0 t/ha), and technology indices (36.6%). It also demonstrated a higher percentage yield gain over local types, with a yield increase of 20%. It means that even after FLD, proven technologies were still widely applied. Extension gap that was computed throughout the study period highlights the need for farmers to be educated about adopting improved agricultural production practices in order to buck the trend of a huge extension gap. These results were consistent with the work of Kaur et al. [5] and Mitra and Samajdar [6] Table 2.

"The causes for such a large technology gap may be attributed to environmental differences between research stations, extension worker and farmer's fields and non adoption of production technology" [7,8]. It could be reduced through considerable co- ordination between researchers, extension workers and farmers. The aforementioned findings concurred with those of Hiremath and Hilli [9], Jadav and Solanki [10], Desai et al. [2] and Rajamanickam, [11].

The information regarding the yield has been presented in Table 3. The data revealed that the yield of brinjal per hectare increased by 20per cent in FLD plots. This yield indicated the significant difference in yield parameters before and after conduct of FLD plots. It means that even after FLD, there was wider adoption of demonstrated technologies in brinjal. These findings are in accordance with the research findings of Yadav et al. [12], Desai et al. [2] and Rajamanickam, [11].

Calculating the total cost of cultivation, gross return, net return, and B:C ratio (BCR) of the before FLD plot and after FLD plot allowed researchers to determine the economic viability of the demonstration technologies above and above the control.

The economic impact of demonstrated brinjal production was worked out by calculating total cost of cultivation, gross return, net return and B:C Ratio of before and after FLD plot. The data in Table 3 revealed that before FLD, the yield of brinjal was obtained 32.0 t/ha, while yield after FLD it was 38.0 t/ha.

Table 2. Yield gap and yield index analysis in brinjal

Technology	Potential yield (t/ha)	Increase per cent over farmers practice	Technology gap (t/ha)	Extension gap (t/ha)	Technology index (Per cent)
Actual yield (Farmers Practice)	32.0	-	-	-	-
Demonstration plot Yield	60.0	20	22.0	6.0	36.6

Table 3. Economics of demonstration and farmer's practices in brinjal

S.no.	Particulars	Before demonstration	After demonstration
1	Cost of cultivation (Rs/ha)	99,000	1,00,000
2	Yield of Brinjal (t/ha)	32.0	38.0
3	Gross return (Rs/ha)	3,20,000	3,80,000
4	Net return (Rs/ha)	2,21,000	2,80,000
5	B:C Ratio	3.2	3.8

"The net returns from brinjal before FLD was Rs. 2,21,000/ha, while the net returns from brinjal after FLD was Rs.2,80,000/ha. The B:C ratio for before FLD was 3.2, which was increased to 3.8 after FLD. It was evident from the results that B:C ratio of brinjal FLD was higher than before FLD. This might be due to adoption of all the improved package of practices recommended for brinjal production in the region" [12]. This might be due to good extension contact by FLD farmers of Tiruvallur District with the scientist and extension workers. Similar results were reported by Patel and Patel [13], Shinde [14], Sharma and Sharma [15] and Desai et al. [2] and Rajamanickam, [11].

The technical gap can be significantly closed by using scientific brinjal farming techniques, which will increase the district's output and boost the producers' economic standing. Also, in order to close the extension gap and improve the district's output of brinjal, extension organizations in the area must offer the farmers sufficient technical assistance using a variety of educational and extension methods.

4. CONCLUSION

Farmers were successfully influenced by the frontline demonstration waseffective changing of farmers towards the adoption of integrated crop management practices inbrinjal production. Most of the farmers became aware about recommended production practices of brinjal after conducting the frontline demonstration onfarmer's field. Further more number of farmers werefound to be adopted improved package of practices such as raising and selection of quality seedling from nursery, selection of high yielding variety, placement of traps, etc after conduct of FLD as compared to before FLD. The concept of frontline demonstration may be applied toall farmer categories including progressivefarmers for speedy and wider disseminationof the recommended practices to othermembers of the farming community, with respect to brinjal cultivation [11]. The increased productivity under FLD above current methods of brinjal growing awareness and encouraged other farmers in the district to adopt acceptable production techniques for brinjal.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Chatuirvedi A, Kumar R, Mishra PK. Front line demonstration (FLD) on integrated crop management practices in brinjal. Just Agriculture. 2023;3(8):199-204.
2. Desai N, Patil C, Mamatha B. Effect of integrated crop management on brinjal yield and economics through frontline demonstration at farmer's field. Internat. J. Agric. Sci. 2018;14(1):154-159.
3. Samui SK, MaitraS, RoyDK, Mondal AK, Saha D. Evaluation on front line demonstration on groundnut (*Arachis hypogaea* L.). J. Indian Soc. Coastal Agric. Res. 2000;18:180-183.
4. Dayan, VRK Mehta SM. Boosting mustard production through front line

demonstrations. Indian Res J Ext Edu. 2012;12(3):121-123.
5. Kaur A, Hardeep S, Sabhikhi S, Gurpreet S, JasW, Kaur G. Yield gap analysis in paddy based on demonstration on seed treatment technique for control of bacterial leaf blight. J. Krishi Vigyan. 2013;2(1):79-81.
6. Mitra B, Samajdar Tanmay. Yield gap analysis of rape seed –Mustard through frontline demonstration. Agric. Extn. Rev. 2010;22(1):16-17.
7. Mishra DK, Tailor RS, Pathak G, Deshwal A. Yield gap analysis of blight disease management in potato through front line demonstration. Indian Res. J. Extn. Edu. 2007;7(2&3):82-84.
8. Kiran ST. A study on technological gap and constraints in adoption of recommended practices of mango growers. M. Sc. (Ag.) Thesis, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, M.S. (INDIA); 2003.
9. Hiremath SM, Hill JS. Yield gap analysis in chilli production technology. Asian J. Hort. 2012;7(2):347-350.
10. Jadav NB, Solanki MM. Technological gap in adoption of improved mango production technology. Agric. Update. 2009;4(1&2): 59-61.
11. Rajamanickam C. Front line demonstration (FLD) on integrated crop management practices in brinjal. Int.J.Curr.Microbiol. App.Sci. 2020;9(12):2266-2271.
12. Yadav DB, Kamboj BK, Garg RB. Increasing the productivity and profitability of sunflower through front line demonstrations in irrigated agro-ecosystem of eastern Haryana. Haryana J. Agron. 2004;20(1&2):33-35.
13. Patel RN, Patel JR. Impact of front line demonstration on mustard growers. Gujarat J. Extn. Edu. 2014;25:91-92.
14. Shinde AS. Impact of production technology of mango: An economic analysis. M.Sc. (Ag.) Thesis, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri, M.S. (INDIA); 2011.
15. Sharma RN, Sharma KC. Evaluation of front line demonstration trials on oilseeds in barren district of Rajasthan, Madhya. J. Extn. Edu. 2004;7:72-75.

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