

## Integrated Crop Management Practices on Yield and Economics of Brinjal at Tiruvallur District of Tamilnadu

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**ABSTRACT:** The present study highlights the Integrated crop management in brinjal for their yield and economics. ~~A study on effect of integrated crop management practices on yield and economics of brinjal in Tiruvallur district of Tamil Nadu was conducted with a~~ field experiments ~~was developed in tiruvallur district of~~ ICAR-Krishi Vigyan Kendra during 2017-2018. The development of the horticulture is primarily dependent on the application of the scientific technologies by making the best use of available resources. One of the major constraints of traditional brinjal farming is low productivity because of non-adoption of advanced technologies. The main objective of frontline demonstration was to demonstrate newly released crop production, protection technologies and its management practices at the progressive farmer's field and farming situations and also convincing farmers about the brinjal production technologies for further wide scale diffusion of technologies. 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 front line demonstrations as compared to farmers practice. The adoption and implementation of integrated crop management practices through Front Line Demonstration - FLD programme, showed positive impact on brinjal growth, yield and economics.

**Comment [CdM1]:** The Abstract is too long. It is not necessary to include details related to description of the experiment. So, these phrases can be discarded here.

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Demonstration plot recorded higher technology gap (22.0 t/ha), extension gap ( 6.0 t/ha) and technology index (36.6 per cent), as compared 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 tamil nadu was conducted during 2017-18.~~

**Key Words:** Brinjal, Front Line demonstration, yield, economics

**Comment [CdM2]:** It is a rule of the scientific journals do not accept using as key-words terms present in the Title of the manuscript.

### 1. INTRODUCTION

Increasing population and decreasing cultivable area conducted to the need of production of food all produces to be year around with high productivity, irrespective of season. In India, because a wide climate diversity with peak in 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 covering the largest area and production, and playings 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 producing 128.01 lakh tonnes, with a productivity of 17.50 t/ha.

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In Tiruvallur district, brinjals are 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 upto 40%. ICAR-KVK, Tirur, Tiruvallur conducted integrated crop management on brinjal yield and economics through front line demonstration – FLD - at farmers' field.

The main objective of FLD front line demonstration was to demonstrate the newly released crop production, protection technologies and its management practices at the farmer's field level 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 front line demonstrations – FLD - were conducted on brinjal crop (Variety: COBH-2) at farmers' field of Tiruvallur district, Tamil Nadu, during the year 2017-18 in ten villages. The critical inputs were supplied to farmers and applied as per the package of practices for brinjal crop recommended by Tamil Nadu Agricultural University, Coimbatore. Before conducting FLDs, a list of farmers was prepared from group meeting and specific skill training was imparted to the selected progressive farmers regarding different aspects of brinjal cultivation. Inputs like IIHR Arka Vegetable Special, *Pseudomonas fluorescences*, 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 litre of water was applied during the critical periods of pre flowering, flowering and fruit development stages. Yellow sticky traps @ 15 numbers

per acre were placed in different directions of the plot. ~~Five~~ Wota-T traps @ ~~five numbers~~ per acre were placed at different directions of the demonstrated plot to control the shoot and fruit borer moths.

~~Use of h~~High-quality seeds of the improved variety COBH-2, 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 ~~of the~~ demonstrated package of practices and ~~the~~ farmers practices were followed as mentioned in Table 1. Data were collected on potential yield of the brinjal in a given situation. Besides this, demonstrated plot yield was obtained using the data from FLD ~~frontline demonstrations~~ conducted in the farmer's field under the close supervision of scientists from ICAR-KVK, Tiruvallur in Soranjerivillage. Further, information on actual yield obtained by the farmers on their farms under their own management practices was also collected. The extension tools were worked out using the formulae of Samui et al. (2000) and Dayanand et al. (2012), as described ~~given~~ below.

1) Technology gap = Potential Yield - Demonstration Yield;

2) Extension gap = Demonstration Yield - Farmer's Practice Yield;

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

4) ~~Percentage increase %~~ over Farmers practice =  $\frac{(\text{Demonstration Yield} - \text{Farmer's Practice Yield})}{\text{Farmer's Practice Yield}} \times 100$ ;

### 3. RESULTS AND DISCUSSION

The potential yield of brinjal was found to be 60.0 t/ha and the ~~demonstration~~ plot yield obtained through frontline demonstrations (FLD) was 38.0 t/ha. ~~The d~~ Demonstration plot recorded higher technology gap (22.0 t/ha), extension gap (6.0 t/ha) and technology index (36.6 per cent), compared to local variety and also showed high percentage yield increase over local

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type, ~~and~~ recorded ~~ing~~ 20 per cent increase yield. It implies that proved technologies were widely used, even after FLD. 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. (2013) and Mitra and Samajdar (2010) (Table 2).

The causes for such a large technology gap may be attributed to environmental differences between research stations, extension workers and farmer's fields, and non adoption of production technology (Mishra et al. 2007 and Kiran, 2003). It could be reduced through considerable co-ordination between researchers, extension workers and farmers. The aforementioned findings concurred with those of Hiremath and Hilli (2012), Jadav and Solanki (2009), Desai et al. (2018) and Rajamanickam, (2020).

The information regarding the yield ~~are~~ presented in Table 3. The data revealed that the yield of brinjal per hectare increased by 20 per cent in FLD plots. This yield ~~showed~~ indicated a 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. (2004), Desai et al. (2018) and Rajamanickam, (2020).

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 ~~below~~ above the control. 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.

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 ~~obtained~~ yield of brinjal was ~~obtained~~ 32.0 t/ha, while yield after FLD ~~it~~ was 38.0 t/ha.

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 ~~after~~ after FLD was higher than before FLD. This might be due to adoption of all the improved package ~~of~~ practices

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recommended for brinjal production in the region (Yadav et al.2004). 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 (2014); Shinde (2011), Sharma and Sharma (2004) and Desai et al.(2018) and Rajamanickam, (2020).

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 – FLD – of was the effective changing of farmers towards the adoption of integrated crop management practices in brinjal production. Most of the farmers became aware about recommended production practices of brinjal after conducting the FLD frontline demonstration on farmer's field. Further, more number of farmers were found to be adopted improved package of practices such as raising and selecting of good quality seedling from nursery, selection of high yielding variety, application of vegetable special, placement of traps, etc after conduct of FLD as compared to before FLD. The concept of frontline demonstration FLD can may be applied to all farmer categories, including progressive farmers for speedy and wider dissemination of the recommended practices to other members of the farming community, with respect to brinjal cultivation (Rajamanickam, (2020)). The increased productivity under FLD above current methods of brinjal growing raised awareness and encouraged other farmers in the district to adopt acceptable production techniques for brinjal.

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Comment [CdM7]: Always as **Conclusions** it is necessary to use the verb in the present, indicating that we are convinced about the truth of the obtained results.

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**Table 1.** Demonstrated package of practices and farmer's practice for ICM in Brinjal of Tiruvallur district of Tamil Nadu

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| 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 <i>Pseudomonas fluorescens</i> @ 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 <sub>2</sub> O <sub>5</sub> + 100 kg K <sub>2</sub> O per ha <sup>-1</sup> along with 2 kg each of <i>Azospirillum</i> and <i>Phosphobacteria</i> | 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   |

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| <b>N<sup>o</sup></b> |                             |          | <b>demonstration</b> |
|----------------------|-----------------------------|----------|----------------------|
| <b>1</b>             | Cost of cultivation (Rs/ha) | 99,000   | 1,00,000             |
| <b>2</b>             | Yield of Brinjal (t/ha)     | 32.0     | 38.0                 |
| <b>3</b>             | Gross return (Rs/ha)        | 3,20,000 | 3,80,000             |
| <b>4</b>             | Net return (Rs/ha)          | 2,21,000 | 2,80,000             |
| <b>5</b>             | B:C Ratio                   | 3.2      | 3.8                  |

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