

Impact of Frontline Demonstration on Integrated Crop ~~management~~ Management practices Practices in Brinjal in Arunachal Pradesh

ABSTRACT

The twenty numbers of frontline Demonstrations on Integrated Crop ~~management~~ Management practices in Brinjal were demonstrated in selected villages of Tirap district, Arunachal Pradesh, India during Rabi season, 2017-18 and 2018-19 respectively. Before conducting the demonstration; field level surveys were conducted in selected villages to know the ~~farmers~~ farmer's practices. As per result of survey; there was huge gap between scientific practices and ~~farmers~~ farmer's practices. On the basis of surveys, KVK Tirap, Arunachal Pradesh conducted the demonstrations. The extension gap was recorded during the demonstration as 40 & 59 q/ha respectively while the yield was: 238 & 246 q/ha, Benefit Cost:Ratio ~~Ratio~~ - was 3.63 & 3.54 as compared control (198 & 187 q/ha, 2.37, 2.12).

Key words: Frontline Demonstration, ~~integrated~~ Integrated crop ~~Crop~~ management ~~Management~~, ~~brinjal~~ Brinjal

1. INTRODUCTION

With its vast geographic area and varied agro-climatic conditions, Arunachal Pradesh is well suited for growing varieties of vegetable crops. In India, this significant vegetable crop brinjal (*Solanum melongena* L.) is grown over an area of 7.43 lakh hectares and produces 128.01 ~~128.01~~ lakh tonnes with a productivity of 17.50 t/ha. India's major states for brinjal production include West Bengal, Odisha, Gujarat, Madhya Pradesh, Bihar, Chhattisgarh, Andhra Pradesh and Karnataka. In comparison to the national average of 17.16 tons/ha, Arunachal Pradesh has an area of 330 ha, produces 1790 tonnes and has an average productivity of 5.42 tons/ha (NHB data base, 2020-21).

In the Tirap district, brinjal is grown throughout the year, providing farmers with significant profits. The brinjal's shoot and fruit borer has developed a very serious problem in the district recently, resulting in a significant yield loss of between 20% and 40%. Krishi Vigyan Kendra, Tirap conducted integrated crop management on brinjal yield and economics through frontline demonstration at farmers' field. The main objective of frontline demonstration was to demonstrate newly released crop production, protection technologies and its management

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practices at the farmer's field under different agro-climatic regions and farming situations and also convincing farmers about the brinjal production technologies for further wide scale diffusion. Therefore, a study on effect of integrated crop management practices on yield and economics of Brinjal in Tirap district of Arunachal Pradesh was conducted during Rabi season of 2017-18 and 2018-19 respectively.

2. MATERIALS AND METHODS

The Frontline demonstrations were conducted on brinjal crop (Variety: GB/Abu) at farmers' field of Tirap district, Arunachal Pradesh, India during Rabi season of 2017-18 and 2018-19 respectively in nine villages namely Deomali, Namsang, Makat, Noitong, Soha, Doidam, Turret, Khela and Panidurya. The total twenty (20) numbers of demonstrations having 0.1 ha plot size were demonstrated during the both years. The critical inputs were supplied to farmers and applied as per the package of practices for brinjal crop recommended by Assam Agricultural university- Jorhat. Before conducting FLDs, a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers regarding different aspects of cultivation. The difference between the demonstration package and existing farmers' practices are mentioned in below's table-

Table 1. Package and Farmers' Practices demonstrated in Brinjal FLD.

| Particular | Technological intervention | Existing practices | Gap |
|---|--|---|-------------|
| Variety | GB(Abu) | Local or unknown Private hybrid/variety | Full gap |
| Seed rate | 145 g /ha | 200 g /ha | Partial gap |
| Seed treatment | Seed was treated | Not treated | Full gap |
| Transplanting method | Transplanting on raised bed | Flat bed | Full gap |
| Spacing | 90cm x 60 cm | 60cm x 30 cm | Partial gap |
| Application of recommended dose of manure | 5kg/ meter ² | Nil/without recommendation | Partial gap |
| Application of Bio fertilizer | Soil application of Azospirillum & PSB @ 2kg/ha mix with FYM | No application | Full gap |
| Plant protection measures for | Need based application of plant protection bio- | Not followed, any type of | Full gap |

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| control of insect pest and disease | pesticides for control: Fruit fly, mites and sucking pest - Spray of 5 % NSKE | spray | |
| Harvesting | Manual | Manual | No Gap |

In Arunachal Pradesh three types of Agro-climatic zones are prevails. ~~the~~The Tirap district falls under Eastern Himalayan Region (Zone II), Sub region:- Per Humid Hyper Thermic Foothills; where hot and humidity is very common characteristics. The rains start from End of February and continue up to September. The ~~intermediatory~~intermediator dry spells are often occurs which are very heat and humid.

Table No-2. The weather during the research period

| Month | Rainfall(mm) | | Temperature °C | | | | Relative Humidity (%) | | | |
|-----------------|--------------|-------|----------------|------|------|------|-----------------------|----|------|----|
| | 2017 | 2018 | 2017 | | 2018 | | 2017 | | 2018 | |
| | | | Max. | Min. | Max. | Min. | M | E | M | E |
| April- 2017 | 247 | 186.0 | 34.4 | 12.2 | 35.2 | 13.2 | 82 | 67 | 81 | 65 |
| May- 2017 | 327 | 117.5 | 35.6 | 14.6 | 36.7 | 15.1 | 86 | 73 | 89 | 75 |
| June-2017 | 241 | 433.4 | 36.8 | 16.5 | 37.7 | 17.2 | 91 | 80 | 93 | 82 |
| July-2017 | 347 | 336.6 | 34.2 | 18.4 | 35.4 | 18.9 | 93 | 83 | 95 | 81 |
| August- 2017 | 493 | 277.3 | 33 | 19.1 | 34.2 | 20.1 | 87 | 85 | 89 | 87 |
| September- 2017 | 371 | 186.2 | 32.3 | 18.8 | 33.6 | 20.1 | 88 | 84 | 91 | 86 |
| October- 2017 | 162 | 118.0 | 26.5 | 17.2 | 27.4 | 18.4 | 89 | 90 | 92 | 92 |
| November- 2017 | 7.6 | 15.4 | 25.1 | 12.3 | 25.9 | 14.1 | 87 | 82 | 89 | 88 |
| December- 2017 | 0 | 0 | 25.8 | 9.4 | 26.2 | 10.2 | 85 | 83 | 86 | 87 |
| January- 2018 | 12.2 | 12.7 | 25.4 | 8.6 | 26.2 | 9.1 | 85.7 | 88 | 84.9 | 88 |
| February- 2018 | 69.6 | 69.0 | 26.1 | 7.9 | 26.9 | 8.3 | 88 | 90 | 83 | 92 |
| March- 2018 | 138.2 | 123.0 | 28.7 | 8.8 | 29.1 | 9.2 | 85 | 81 | 82 | 83 |

Where Max. denotes maximum, min. denotes minimum, M denotes Morning, E denotes evening

Use of high-quality seeds of the improved variety GB (Abu) obtained from AAU, Jorhat were sowed in nurseries and transplanted in raised beds with the use of organic manure in demonstration plots. The customary ways were seen as a local check. The output data were gathered from FLD plots and control plots and then the extension gap, technology gap, and

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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. Also, information on the farmers' customary methods of production was gathered. The formulas presented by Samui et al. (2000) and Dayanand et al. (2012) were used to calculate the technology gap, extension gap, and technology index as shown below:

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1. Technology gap = Potential yield (kg/ha) - Demonstration yield (kg/ha);
2. Extension gap = Demonstration yield (kg/ha) - Farmers yield (kg/ha)

$$3. \text{ Technology index} = \frac{\text{Potential Yield} - \text{Demonstration yield}}{\text{Potential yield}} \times 100$$

$$4. \text{ Impact on yield (\% increase over control)} = \frac{\text{Yield of demonstration plot} - \text{yield of control plot}}{\text{Yield of control plot}} \times 100$$

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3. RESULTS AND DISCUSSION

The productivity of brinjal in the Tirap area was reported to range from 247 to 228 q/ha with better production technology, with a mean yield of 238 q/ha, which is 25% higher than farmers' custom (Table-3). It implies that proved technologies were widely used even after FLD. These results were consistent with the work of Yadav and colleagues (2004). The high yielding potential variety, soil type, proper crop management and need-based application of a biocontrol material to control insect pests were the key contributors to the increased fruit yield of brinjal (Singh NK, 2020). The aforementioned findings concurred with those of Singh et al (2011) and Kale (2020). The 40 q/ha 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. The farmer's participation in putting out such a demonstration with good results was reflected in the trend of the technology gap of 112 q/ha. Kishore (2018) had also justified the similar results. Ramkrishna et al. (2007) has mentioned that training and awareness programmes are the vital factors for creating awareness among farming community. The difference in weather and soil fertility status may be the cause of the observed technological gap. The technology index (32%) demonstrates the viability of the

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presented technology. Rajhansa KC *et al.* (2021) and Shalini (2016) also revealed that improved package of practices can enhance the brinjal productivity at farmer's field.

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Table 3. Technology gap, Extension gap, Technology index and Productivity enhancement in Brinjal

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| Year | Fruityield (q/ha) | | | Increase in productivity (%) | Technology gap (q/ha) | Extension gap (q/ha) | Technology index (%) |
|---------|-------------------|---------------|---------|------------------------------|-----------------------|----------------------|----------------------|
| | Potential | Demonstration | Control | | | | |
| 2017-18 | | 238 | 198 | 20 | 112 | 40 | 32 |
| 2018-19 | 350 | 246 | 187 | 32 | 104 | 59 | 30 |

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Table 4. Cost of cultivation (Rs/ha), net return (Rs/ha) and benefit:cost ratio of Brinjal as affected by demonstration and local practices control.

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| Year | Yield (q/ha) | | Cost of Cultivation (Rs/ha) | | Gross Return (Rs/ha) | | Net Return (Rs/ha) | | Benefit:Cost ratio B:C Ratio | |
|---------|---------------|---------|-----------------------------|---------|----------------------|----------|--------------------|----------|------------------------------|---------|
| | Demonstration | Control | Demonstration | Control | Demonstration | Control | Demonstration | Control | Demonstration | Control |
| 2017-18 | 238 | 198 | 52,632 | 58,624 | 2,38,000 | 1,98,000 | 1,91,368 | 1,39,376 | 3.63 | 2.37 |
| 2018-19 | 246 | 187 | 54,214 | 59,829 | 2,46,000 | 1,87,000 | 1,91,786 | 1,27,171 | 3.53 | 2.12 |

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Calculating the total cost of cultivation, gross return, net return, and B:Cost

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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 sum of the costs for labour, irrigation, plant protection measures, seed, manure, and soil preparation was used to compute the overall cost of cultivation. It was discovered that the demonstration's cost of producing brinjal per hectare was Rs 52,632 as opposed to Rs 58624 under the control (Table-4). 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(Adowaker, 2019, Desai, 2016 and Kumar, 2016).Also,inordertoclosetheextensionongapandimprovethe district's outputofbrinjal,extension organizationsintheareamustofferthefarmerssufficienttechnical assistance using a variety of educational and extension methods.Sumathiet al. (2018) has revealed that proper integrated pest management practices can enhanced the yield of brinjal in the country, He further added that these integrated pest management practices have to be disseminated on farmersfarmer's field for better outcome as well. Patraet al.(2016) and Srinivasan (2000) has mentioned that different types of biopesticides and insecticides are the best option to control major pest of brinjal like- fruit borer, stem borer, fruit fly etc. He has proved that bioagents enhances the brinjal yield with environmental safety; which are the main concern in the era of global warming.

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4. CONCLUSION

Farmers were successfully influenced by the frontline demonstration to adopt Integrated Crop Management in the production of brinjal. Following the frontline demonstration in the farmers' fields, the majority of the farmers were aware of the recommended brinjal cultivation procedures. B:C ratioCR, net return, and brinjal yield all increased in the demonstration plot compared to farmer practice. 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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