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

Abstract

The twenty numbers of frontline Demonstrations on Integrated Crop management practices in Brinjal were demonstrated in selected villages of Tirap district, Arunachal Pradesh 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 practices. As per result of survey; there was huge gap between scientific practices and farmers 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, B:C ratio: 3.63 & 3.54 as compared control (198 & 187 q/ha, 2.37, 2.12.

Key words: Frontline Demonstration, integrated crop management, brinjal

Introduction

With its vast geographic area and varied agro-climatic conditions, Arunachal Pradesh is well suited for growingvarieties ofvegetable crops. In India, thesignificant vegetable crop brinjal(*Solanummelongena*L.)isgrownoveranareaof7.43lakhhectaresandproduces 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 cropmanagementonbrinjalyieldand economics through frontline demonstration at farmers' field. The main objective of frontline demonstration was to demonstrate newly released crop production, protection technologies andits management practices at the farmer's field under different agro-climaticregionsand farmingsituationsandalso convincing farmers about the brinjal productiontechnologies 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.

MaterialsandMethods

The Frontline demonstrations were conducted on brinjal crop (Variety: GB/Abu) at farmers' field of Tirap district, ArunachalPradeshduring Rabi season of 2017-18 and 2018-19 respectively in nine villages namely Deomali, Namsang, Makat, Noitong, Soha, Doidam, Turret, Khela and Panidurya. Thetotal 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 farmerspractices are mentioned in bellow's table-

Table1.PackageandFarmers'PracticesdemonstratedinBrinjalFLD.

Particular	**Technological intervention**	**Existingpractices**	**Gap**
Variety	GB(Abu)	Localorunknown Privatehybrid/variety	Fullgap
Seed rate	145 g /ha	200 g /ha	Partial gap
Seed treatment	Seed was treated	Not treated	Full gap
Transplanting method	Transplantingonraised bed	Flat bed	Full gap
Spacing	90cm x60 cm	60cm x30 cm	Partial gap
Applicationof recommended doseof manure	5kg/ meter^2	Nil/without recommend ation	Partial gap
Application of Bio fertilizer	Soilapplication of Azospirillum &PSB@2kg/hamixwith FYM	No application	Full gap
Plant protection measures for control of insect pest and disease	Need based application of plant protection bio-pesticides for control: Fruit fly, mites and sucking pest - Spray of 5 % NSKE	Not followed, any type of spray	Full gap
Harvesting	Manual	Manual	No Gap

In Arunachal Pradesh three types of Agro-climatic zones are prevails. 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 dry spells are often occurs which are very heat and humid.

Table No- 2 The weather during the research period

Month	Rainfall(mm)		Temperature ^{0}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 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 onthe 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:

1. Technologygap=Potentialyield(kg/ha)-Demonstrationyield(kg/ha);
2. Extensiongap=Demonstrationyield(kg/ha)–Farmersyield(kg/ha)

3. $$\text{Technologyindex} = \frac{\text{PotentialYield-Demonstrationyield}}{\text{Potentialyield}} \times 100$$

4. $$\text{Impact on yield (\%increaseovercontrol)} = \frac{\text{Yieldofdemonstrationplot–yieldofcontrolplot}}{\text{Yieldof control plot}} \times 100$$

ResultsandDiscussion

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 ofa 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 practicesin order to buck the trend of a huge extension gap. The farmer's participation in putting out suchademonstrationwithgoodresultswasreflectedinthetrendofthetechnologygapof 112 q/ha. Kishore (2018) had also justified the similar results.Ramkrishnana *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 fertilitystatus maybe the cause of the observed technological gap. The technology index (32%) demonstrates the viability of the 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.

Table3.Technologygap,Extensiongap,TechnologyindexandProductivityenhancement inBrinjal

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

Table4.Costofcultivation(Rs/ha),netreturn (Rs/ha)andbenefit:costratio ofBrinjal as affected by demonstration and local practices control.

Year	Yield(q/ha)		Costof Cultivation (Rs/ha)		Gross Return (Rs/ha)		Net Return (Rs/ha)		BenefitCost ratio B:CRatio	
	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

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 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,inordertoclosetheextensionongapandimprovethedistrict'soutputofbrinjal,extensionorganizationsintheareamustofferthefarmerssufficienttechnical assistance using a variety of educational and extension methods. Sumathi *et 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 farmers field for better outcome as well. Patra *et 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.

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 ratio, 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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