Productivity And Profitability Of Toria through Frontline Demonstrations (CFLD) In Morigaon District

ABSTRACT

In Morigaon district Assam, 716 demonstrations on High Yielding Variety (HYV) of toria TS-38 were conducted during five consecutive years. The study revealed that the yield of toria with HYV and improved production technology has been increased significantly as compared to local varieties and farmer's practice. The demo yield was obtained in range from 9.5 to 12 quintal/hectareagainst 5.5 to 8.4 q/ha. The percentage increase over farmer's practice was obtained from 26.67 to 72.73%. the average technology gap, extension gap and technology index were found to be -0.9 q/ha, 3.62 quintal/hectareand -9.00 quintal/hectarerespectively. Introducing high yielding varieties with improved production technology, the yield of toria can be enhanced to a great extent with economic conditions of farmers of the community.

Key words: Yield gap, Technology gap, Extension gap, Technology index, Economics

INTRODUCTION

Morigaon district being flood affected, huge areas remain fallow during the Khariff season and the farmers mostly prefer toria as a short duration crop before going for cultivation of Summer paddy. Toria is one of the most important rabi oilseed crop grown in Assam.

The production and productivity of local variety is comparatively low due to lack of irrigation facility, but is still existing due to its distinguish character of growing in rainfed condition. TS -38 is newly developed variety of toria with high yield potential and high oil content as compared to other local varieties of toria available in the district. Realizing the importance of high yielding varieties, cluster frontline demonstrations were conducted in different locations from 2015-16 with improved production technology.

. These demonstrations are designed carefully where provisions are made for speedy dissemination of demonstrated technology among farming community through organization of supportive extension activities, such as Kisan Gostis, field days and group discussion.

MATERIALS AND METHODS

Krishi Vigyan Kendra Morigaon conducted cluster frontline demonstrations of toria in different operational areas of the district, to disseminate the improved production technology

and high yielding varieties of toria. From 2015-16 to 2019-20, a total of 716 demonstrations in the villages given "Fig. 1" were covered involving 716 farmers and covering 280 ha area in rabi season. Each demonstration was conducted on an area of 0.4 ha, and an area adjacent to the demonstration plot was kept as farmers' practices.

"Fig. 1" : Map of Morigaon district in Assam

The package of improved technologies like required seed rate, nutrient management, seed treatment and whole packages were used in the demonstrations Before conducting the demonstrations, training and method demonstrations of seed treatment with PSB and Azotobacter were imparted to the selected farmers. The sowing was done from mid-October to mid-November in broadcasting manner. Data were collected from both the improved and farmers practices and analyzed for cost of cultivation, net income, benefit cost ratio etc. The yield of demonstration plot as well as local check were recorded using random crop cutting. Qualitative data was converted into quantitative form and expressed in terms of per cent increase in yield (Narasimha Rao "et al.", ., 2007) The extension gap, technological gap and technological index along with the benefit cost ratio were worked out (Samui "et al.", ., 2000) as given below

1.Technology gap = Potential yield (kg/ha) – Demonstration Yield (kg/ha)
2.Extension gap = Demonstration Yield (kg/ha) – Farmer's yield (kg/ha)
3.Technology index = (Technology Gap/ Potential yield} x 100 (%)

Table 1: Details of technologies followed in the Cluster Front Line Demonstration

Particulars	Improved practices (IP)	Farmers Practice (FP)
Variety	TS-38	Local
Seed Rate (kg/ha)	8	12
Seed treatment	PSB @ 50 gm/kg seed and Azotobacter @ 50 gm/kg seed	Nil
Farming Situation	Rainfed medium land	Rainfed medium land
Land preparation	4-5 ploughings (Depending on soil type) to obtain a good tilth	2-3 ploughings
Time of sowing	Mid October to Mid November	Mid October to Mid December
Fertilizer application	Organic cultivation with vermicompost	Imbalanced use of chemical fertilizers
Micronutrient	Borax @ 7.5 kg/ha	Nil
Plant protection	Need based application	Nil

RESULTS AND DISCSSION

Yield: The average yield of toria variety TS-38 were found 9.5, 12, 11.5, 12 and 9.5 quintal/hectare during the year 2015-16 to 2019-20 respectively, however under farmer's practice the average yield was 7.5, 8.4, 7.5, 7.5 and 5.5 quintal/hectare during respective years. The percentage increase in yield over control was found 26.67, 42.86, 53.33, 60.00 and 72.73 during the year 2015-16 to 2019-20 respectively. The result is in conformity with the findings of Tiwari *"et al.",* (2001), Raj *"et al.",* (2013) and Lydia *"et al.",* (2020).

The Cluster Frontline Demonstrations (CFLD) have given a good impact over the farming community of Morigaon district of Assam. The high yielding variety of toria, TS-38 has enhanced the productivity of toria as compared to other local varieties as well as has increased the income of the farmers. In subsequent years it was observed that farmers are using their own seeds for the next year also, farmer to farmer seed exchange was observed within the village and outside through nearby farmers, relatives and friends. This finding was also in corroboration with the findings of Poonia *"et al.",* (2010) and Lydia Z *"et al.",* (2020).

Table 2. Productivity, technology gap, extension gap and technology index of toria variety TS-38 under CFLD.

Year	Area	No. of	Seed yield (q/ha)	%	Tech.	Extensio	Tech.

	(ha)	**farmer**	Potential	Demo	Control	**increase over control**	**Gap (q/ha)**	**n gap (q/ha)**	**Index (%)**
2015-16	20	50	10	9.5	7.5	26.67	0.5	2	5
2016-17	30	75	10	12	8.4	42.86	-2	3.6	-20
2017-18	30	75	10	11.5	7.5	53.33	-1.5	4	-15
2018-19	50	125	10	12	7.5	60.00	-2	4.5	-20
2019-20	150	391	10	9.5	5.5	72.73	0.5	4	5

Yield gap: The yield gap is the difference between the farmers potential yield and its current yield. In the present study the yield gap was categorized into technological and extension gap. From the data (Table 2) it was observed that the technology gap ranges from -2 to 0.5 quintal/hectare. The negative technology gap implies that the farmers obtained more yield than its potential yield and it may be attributing due to soil fertility status, timely sowing, weather condition and improved management of the crop. The result indicates the positive impact of introducing high yielding varieties in the locality.

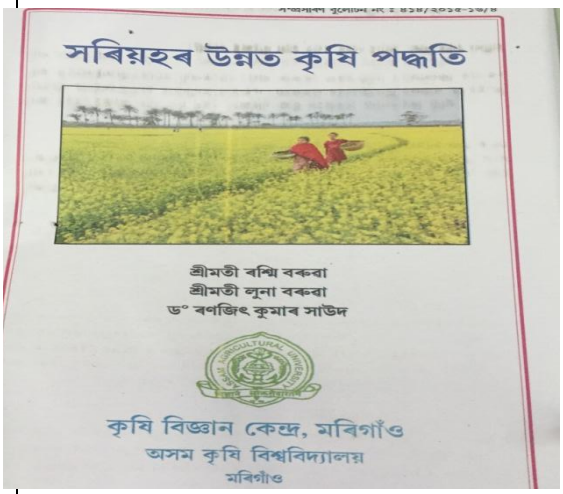
Extension Gap : The extension gap ranges between 2 to 4.5 quintal/hectare during the period of study indicates lack of knowledge in appropriate time of sowing, soil fertility management, and improved production technology on cultivation of toria. Similar findings were observed by Karate *"et al.",* (2011) in oilseeds and *Saikia "et al.",* (2018) and Jha *"et al.",* (2020) in black gram and Bezbaruah *"et al.",* (2020) in green gram. Need based extension literatures, trainings, workshop and advisories from extension specialists may be required to mitigate the extension gap of the farming community.

“Fig. 2” Land preparation monitoring

“Fig. 3”: Demonstration of seed traetment

“Fig. 4” Crop monitoring

“Fig. 5” Crop cutting in presence of ATARI Zone VI



“Fig. 6” Extension literature on Production technology Rapeseed

Technology index: From the data (Table 2), the technology index ranges from -20 to 5%. The lower index means more feasibility of the technology (Jeengar *"et al.",* (2006). This will accelerate the adoption of demonstrated technical intervention to enhance productivity in toria cultivation in rainfed areas. It will have a great impact over the farming community in terms of enhanced productivity and improved economic conditions of the farmers.

Economic return: The input and outputs prices of commodities prevailed during the study of demonstrations were taken for calculating the gross return, cost of cultivation, net return and benefit: cost ratio (Table 2). The cost of cultivation, gross return, net return and benefit: cost ratio was calculated considering the input and output costs of the commodities in their respective years. Cultivation of toria under improved technologies gave higher returns of Rs. 28500.00, 45425.00, 45800.00, 43500.00 and 36100.00 per ha during 2015-16 to 2019-20 respectively. The benefit cost ratio was 1.96, 2.67, 1.72, 2.09 and 1.29 from 2015-16 to 2019-20 respectively. This may be due to higher yield obtained under improved technologies compared to farmers practice. The superiority of recommended package of practices under frontline demonstration over farmers' practice was also reported by Mitra *"et al.",* (2010), Balai *"et al.",* (2012), Raj *"et al.",* (2013), Jyothi *"et al.",* (2016) and Chaudhary *"et al.",* (2018).

Table 3. Economics of improved technologies

Year	Area	No of Demo/Farmer	Results		Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	Benefit: Cost Ratio
			Demo (q/ha)	Check (q/ha)				
2015-16	20	50	9.5	7.5	14500	28500	14000	1.96
2016-17	30	75	12	8.4	17013	45425	28412	2.67
2017-18	30	75	11.5	7.5	26600	45800	19200	1.72
2018-19	50	125	12	7.5	20750	43500	22750	2.09
2019-20	150	391	9.5	5.5	27835	36100	8265	1.29

^ q/ha -quintal/hectare

CONCLUSION

It can be concluded from the study that that introduction of high yielding variety and improved production technology can reduce the technology gap resulting in increased productivity of toria as well as higher income of the farmers in the Morigaon district of Assam. The frontline demonstrations on toria conducted at Morigaon district of Assam during 2015-16 to 2019-20 at the farmers' field revealed that the adoption of improved technologies significantly increased the yield of the crop and also the net returns to the farmers. There was 51.11 per cent increase in yield observed in demonstrated plot over farmers plot (Table 2). Lydia Z *"et al.",* (2020) also reported 42.58 cent increased yield in demonstration plot over farmer's practice. TS -38 released by Assam Agricultural University has been recommended in all India level during the year November 2021. The demonstration fields showed a significant positive effect in technology adoption among the farmers and it also created an opportunity to Extension Scientists to demonstrate the latest technologies with higher productivity and profitability in farmers' field. The productivity level gain and higher returns under demonstration fields over existing farmer's practices created greater awareness and motivated the other farmers to adopt suitable production technology of toria in the district .

Consent

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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