

Original Research Article

<https://doi.org/10.20546/ijcmas.2020.909.214>

Impact Assessment of Cluster Front Line Demonstration on Rapeseed Crop in Darrang District of Assam, India

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ABSTRACT

Keywords

Rapeseed, Yield, High yielding variety, CFLD

Article Info

Accepted:

15 August 2020

Available Online:

10 September 2020

Rapeseed is one of the most important oilseeds crop in Assam, which plays a major role in enhancement the income of marginal and small farmers of Darrang district. One of the major constraints of low productivity of rapeseed farming is using of local varieties. However, delayed sowing & use of higher seed rate resulting into dense plant population, uneven plant population, uncontrolled weeds, ignorance about recommended doses of fertilizers and lack of plant protection measures were the predominant identified causes of low productivity of oilseeds in the district .To replace this problem, Krishi Vigyan Kendra, Darrang conducted Cluster Front Line Demonstration (CFLD) on high yielding rapeseed varieties viz; TS -38 and TS-46 during two consecutive years from 2016–17 to 2017–18. Cultivation of high yielding rapeseed varieties showed percentage increase of 29.17 and 50.8 respectively over local check. The yield under demonstration plots were 7.75 (TS-38) and 8.75 (TS -46) q /ha as compared to 6.0 and 5.8 q /ha respectively in farmer's practices.

Introduction

Rapeseed and mustard are the third most important edible oilseed crops of the world after soybean and oil palm. This crop accounts for nearly one-third of the oil produced in India, making it the country's key edible oilseed crop. Being a major *rabi* (winter season) oilseed crop in India and having an advantage of soil moisture conserved during monsoon, it has greater

potential to increase the availability of edible oil from the domestic production. About 90 per cent of the total edible oil produced in the country comes from two oil seed crops namely rapeseed-mustard and groundnut. In India, rape seed mustard is an important source of edible oil followed by ground nut (Panday *et al.*, 1999). India account for 19.8% and 9.8% of the total acreage and production (USDA). During the last eight years, there has been a considerable increase in productivity

from 1840 kg/ha in 2010-11 to 1980 kg/ha in 2018-19 and production has also increased from 61.64mt in 2010-11 to 72.42 mt in 2018-19 (ICAR, DRMR).The Cluster Front Line Demonstration (CFLD) is an applied approach to accelerate the dissemination of proven & tested technologies at farmer's fields in a participatory mode with an objective to explore the maximum available resources of crop production and also to bridge the productivity gaps by enhancing the production. Therefore, KVKs are being emphasized to organize large scale CFLD programs on oilseed crops for harnessing its productivity potential.

Materials and Methods

Krishi Vigyan Kendra (KVK) has conducted 149 Cluster Front Line Demonstrations on rapeseed crop in farmer's field in different blocks of Darrang district during 2016-17 and 2017-18. For conducting CFLDs, farmers were selected following the survey suggested by Choudhary (1999).The required inputs were supplied and regular visits to the demonstration fields by the KVK scientists ensured with proper guidance to the farmers. Trainings, group meetings and Field days

were also organized to provide the opportunities for other farmers of neighboring village to witness the benefits of demonstrated technologies. The sowing was done during first week of October under assured irrigated conditions (STWs) and harvested during first fortnight of March. However, the practices followed by farmers in general are use local cultivar (M-27), seed rate @ 10-12 kg/ha, no seed treatment, sowing from last week of October to last week of November or after *Sali* paddy, no use of recommended doses of fertilizer, no irrigation and plant protection measures followed. Bee hives boxes were placed @ 5 nos./ha in all demonstrated plots to enhance pollination. The data output were collected from both CFLD plots as well as control plots and cost of cultivation, net income, and benefit cost ratio were also worked out (Samui *et al.*, 2000).

The impact on yield was calculated by using following formula as given below

$$\text{Impact on yield (\% increase)} = \frac{\text{Yield of demonstration plot (q/ha)} - \text{Yield of control plot (q/ha)}}{\text{Yield of control plot (q/ha)}} \times 100$$

Package of practices followed by farmers under CFLD and in farmer's practice

Particulars	Technology Interventions	Farmer's practices
Variety	TS 38, TS 46	M-27
Seed rate	10 kg/ha	10-12 kg/ha
Seed treatment	Seed treatment with metalaxyl 35 WS @ 6 g/kg of seed or Trichoderma @ 810 gm/kg seed	No use
Time of sowing	Mid October- mid November	Last week of October to last week of November
Method of sowing	Broadcasting and east west direction of sowing	Broadcasting, no direction of sowing methods
Fertilizer application	40:35:15 (N:P:K) kg/ha Borax @ 7.5 kg/ha	No proper dose
Water management	One irrigation of 6 cm depth of water may be applied either at 50% flowering or at early siliqua formation stage	No use
Plant protection	Need based application of imidachlopride @ 0.5 ml/l. of water for the management of aphid control	Indiscriminate use
Inclusion of Bee hive	5 honey bee colonies/ha	No use

Results and Discussion

Performances of Rapeseed var. TS- 38 & TS- 46 were found to be substantially higher under the demonstration plots than under control during all the demonstration years (Table 1). The average yield of two varieties (TS- 38 & TS- 46) were 7.75 and 8.75 q/ha during 2016-17 and 2017-18, respectively under CFLD plots however, under farmer's practices the average yield were 6.0 and 5.8 q/ha during respective years. However, the per cent increases against local yield were 29.17 and 50.8 during 2016-17 and 2017-18 respectively. The result is in conformity with the finding of Tiwari and Saxena (2001) and Tiwari *et al.*, (2003) and Chaudhary *et al.*, (2018). The results clearly indicated the positive effect of CFLDs over the existing practices toward enhancing the yield of

rapeseed in the study area due to use of high yielding variety, timely sowing, balance doses of fertilizers along with boron, proper irrigation, need based plant protection and inclusion of honey bee colonies etc. The data of Table 2 reveals that the gross cost, net income and benefit cost ratio were Rs. 24500/ha, Rs. 14250/ha and 1.58 respectively during 2016-17 and Rs. 25700/ha, Rs. 18050/ha and 1.7, respectively during 2017-18 under demonstration plots. However, Rs. 22800/ha gross cost, Rs. 7200/ha net return with 1.32 benefit cost ratio during 2016-17 and Rs. 21969/ha gross cost, Rs. 7031/ha net return with 1.32 benefit cost ratio observed during 2017-18 under farmer's practices. The superiority of recommended package of practices under cluster frontline demonstration over farmers' practice was also reported by Singh *et al.*, (2019) (Fig. 1).

Figure.1 Visit of NITI Aayog Team



Table.1 Yield performance of rapeseed crop under CFLD

Variety	Year	Demonstrations	Area (ha.)	Avg. yield (Q/ha.)		% increase in Avg. yield
				Demo.	Check	
TS- 38	2016-17	24	20.0	7.75	6.0	29.17
TS-46	2017-18	125	50.0	8.75	5.8	50.8

Table.2 Economic indicators of rapeseed crop under CFLD

Variety	Year	Gross expenditure (Rs./ha.)		Gross return (Rs./Ha.)		Net return (Rs./Ha)		B:C Ratio	
		Demo.	FP	Demo.	FP	Demo	FP	Demo.	FP
TS- 38	2016-17	24500/-	22800/-	38750/-	30000/-	14250/-	7200/-	1.58	1.32
TS-46	2017-18	25700/-	21969/-	43750/-	29000/-	18050/-	7031/-	1.7	1.32

The results of cluster front line demonstrations convincingly proved that the yield of rapeseed could be increased by 29.17 per cent to 50.8 per cent with the better technological intervention. These varieties may be popularized in this area by the extension agencies to bridge the higher extension gap. The use of new production technologies will substantially augment the income as well as the livelihood of small and marginal farmers. Therefore, it is suggested that policy maker may provide adequate financial support to frontline extension system for organizing CFLDs under the close supervision of agricultural scientists and extension professionals. This varietal replacement strategy through CFLDs may help to increase the productivity oilseed crops at micro, meso and macro level.

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How to cite this article:
 Rinku Moni Phukon, Bipul Das, Rizwanul Helim and Pabitra Kumar Bordoloi. 2020. Impact Assessment of Cluster Front Line Demonstration on Rapeseed Crop in Darrang District of Assam, India. *Int.J.Curr.Microbiol.App.Sci*. 9(09): 1728-1731.
 doi: <https://doi.org/10.20546/ijcmas.2020.909.214>