P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 8; SP-Issue 1; January 2025; Page No. 42-45

Received: 14-11-2024
Accepted: 23-12-2024

Indexed Journal
Peer Reviewed Journal

Effect on yield and profitability of toria through mega project on rapeseed and mustard in Darrang district of Assam

[1]Mary Sadhana Sarma, [2]Ipsita Ojha, [3]Amrita Khound, [4]Angshuman Sarmah, [5]Bipul Kr. Das, [6]Abdul Hafiz, [7]Pankaj Kumar Deb Choudhury, [8]Binod Kalita and [9]Pabitra Kr. Bordoloi

[1]SMS (Crop Production), KVK, Darrang, Assam, India

[2]SMS (Soil Science), KVK, Darrang, Assam, India

[3]SMS (Horticulture), KVK, Darrang, Assam, India

[4]Senior Research Fellow (NICRA), KVK, Darrang, Assam, India

[5]SMS (Pl. Protection), KVK, Darrang, Assam, India

[6]Sr. Scientist & Head, KVK, Darrang, Assam, India

[7]Principal Scientist, AAU-ZRS, Shillongani, Assam, India

[8]Scientist (Agronomy), AAU-ZRS, Shillongani, Assam, India

[9]Principal Scientist, AAU-ZRS, Shillongani, Assam, India

DOI: https://doi.org/10.33545/26180723.2025.v8.i1Sa.1537

Corresponding Author: Mary Sadhana Sarma

Abstract

The Mega project on Rapeseed & mustard was launched on November 10 last year, 2023 which is implemented by AAU-ZRS Shillongani, Nagaon and ICAR-DRMR, Bharatpur, Rajasthan. The aim of this scheme is to help the farmers of Assam to become more self-reliant by producing improved variety of rapeseed and mustard seed in 6900 bighas of land and pave the for the start of yellow revolution. The area covered in Darrang district under Mega project is 300 bigha with 100 CDs. Both toria as well as mustard variety has been provided to the farmers. A total of 228 bighas of land is allotted for toria variety TS-38 and 72 bigha for mustard variety PM-28. This project was conducted in five clusters of Darrang District under the guidance of Krishi Vigyan Kendra, Darrang. The project was conducted with proper technological guidance to the farmers along with critical input like seed, fertilizer, vermicompost and necessary plant protection measures. Improved crop management practices recorded the highest mean seed yield of 9.9 q ha^{-1} in cluster 2 and 5 followed by 9.8 q ha^{-1} in cluster 3, 9.5 q ha^{-1} in cluster 1 and 9.4 q ha^{-1} in cluster 4 respectively.

Keywords: Rapeseed, mustard, Toria, TS-38, PM-28, mega project

Introduction

Agriculture is considered as the mainstay of the economy of Assam and plays a vital role in the State's economy. Agriculture and allied activities in Assam have overriding importance as source of livelihood to its people. It still contributes more than one forth (26.19%) to the State's Net Domestic Product (NSDP) and supports about 70 Per cent of its population. The net cropped area of the state is 27.53 lakh hectares against gross cropped area of 39.57 lakh hectares. In Assam, farmers grow crops mainly in two seasons i.e. kharif and rabi season. The major kharif crops are autumn rice, winter rice, maize, pulses, kharif oilseeds like seasamum, castor, soyabean, groundnut, kharif vegetables etc. There are some non food crops like jute, mesta, cotton etc. also grown in some extent by the farmers in the kharif season. On the other hand major rabi crops cultivated are summer rice, cereals, wheat, grams, rape & mustard, various rabi oilseeds, rabi vegetables, potato etc. The oilseed that are commonly grown in the Assam are Rapeseed and mustard, soybean, sesame, groundnut Rape & Mustard is the principal oilseeds grown in the State which occupied about 8.00 per cent of the total crop area.

The economy of the Darrang district is basically agrarian where the majority (about 85%) of the population is engaged in agriculture and allied activities. Rice is the main crop in Darrang district followed by other crops like rapeseed & mustard, jute, potato, rabi vegetable etc. Darrang district of Assam has a sizeable area under rapeseed-mustard cultivation with area 18267 ha and production and 13608.93MT and productivity of 745 kg ha^{-1} (DAO, Darrang, 2021-2022). Productivity of the crop is lower in farmer's field due to several constraints such as soil acidity problem, water scarcity during post monsoon season, lack of irrigation facilities, short time lag after rice harvest for seed sowing and lack of soil test based fertilizer recommendations. Keeping this points in view a Mega

project on rapeseed and mustard including high yielding variety TS-38 covering around 300 bighas of land in Darrang district was conducted in the year 2023.

Details of cluster

KVK, Darrang has conducted the project in five villages. Details of the villages given below

Cluster no.	Cluster location (name of the village)	Block	Area covered (Bigha)		No. of beneficiary
			TS-38	PM-28	
1	Kahibari (Bandia),Darrang	Pub Maangaldai	75	-	25
2	Borkumarpara(Punia), Darrang	Sipajhar	75	-	25
3	Adhamapara	Pachim Mangaladai	75	-	25
4	Chomuapara	Pachim Mangaladai	15	-	7
5	Singimari	Sipajhar	6.0	54.0	18

Materials and Methods

The study was carried out during rabi season on 2023-24 by Krishi Vigyan Kendra, Darrang, Assam Agricultural University. The demonstrations were being conducted in farmers' field at 5 different villages of Darrang district. District Darrang comes under North Bank Plain agro climatic zone of Assam. The soil of the district ranges from old alluvial to new alluvial type. The soil is sandy to sandy loam in texture and acidic in reaction and is characterized by medium to high organic carbon, low to medium phosphorus and potash content.

For conducting the programme a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers regarding different aspect of cultivation. Farmers were provided training to follow the package and practices for rapeseed and mustard cultivation recommended by the Assam Agricultural University, Jorhat. A total of 200 numbers of practicing farmers were selected under the programme covering five villages. In case of Farmers practice, the traditional practices () were followed by using existing variety (Local Behar). The soil sample of the experimental plot was sandy loam in texture. Application of 40: 35:15 kg/ha each of N, P2O5 and K2O along with 10 kg of borax was applied as basal. The selected farmers under the programme were guided by KVK scientists in performing field operations like sowing, spraying, weeding, harvesting etc during the course of training and visits. The traditional practices were maintained in case of farmers practice. Various morpho physiological datas like plant height, number of silliqua/plant, number of pods/silliqua, yield attributes, weather parameters of the five clusters were collected during the programme.

The extension gap, technological gap and technological index along with the benefit cost ratio were worked out (Samui *et al.,* 2000) [1] as given below:

Technology gap = Potential yield - Demonstration yield

Extension gap = Demonstration yield - Farmer's yield

Technology index = (Technology gap/potential yield) x 100

Table 1: Weather data has been collected for the rabi season September 2023 to February 2024

Month	Avg. Max T	Avg. Min T	Total RF (mm)	Avg. BSSH (hr)	Avg. RH-I	Avg. RH-II
Sep'23	34.91	26.31	224.40	6.84	92.23	66.00
Oct'23	31.40	21.80	182.60	1.50	93.13	65.87
Nov'23	29.45	15.96	2.80	8.05	91.13	59.07
Dec'23	26.46	12.62	5.20	7.11	90.97	57.39
Jan'24	24.76	10.36	1.60	6.28	92.77	55.74
Feb'24	25.06	12.43	2.80	4.39	90.24	53.97

Results and Discussion

Yield

It has been observed that in the mega project's Toria variety TS 38 recorded the higher seed yield in each cluster as compared to control. Improved crop management practices recorded the highest mean seed yield of 9.9 q ha^{-1} in cluster 2 and 5 followed by 9.8 q ha^{-1} in cluster 3, 9.5 q ha^{-1} in cluster 1 and 9.4 q ha^{-1} in cluster 4 respectively against the farmers practice 7.1,7.0,6.9,6.6 & 7.4 respectively. The results are in conformity with the findings of (Hiremath *et al.,* 2007; Kumar *et al.,* 2010; Sarma *et al*.2024) [2, 3, 4]. From the results it is evident that the performance of demonstrated plot was found better than the farmers practice under same farming situation. The poor productivity in farmers practice is mainly due to factors like use of non descript local variety, late sowing owing to late vacation of field after harvesting of medium to long duration winter paddy and low level of agronomic management in addition to non availability of resources in time. The result clearly depicts the positive effects of demonstrations over the existing practices towards enhancing the yield of toria in Darrang district.

Technology gap: The average technology gap recorded for the clusters were 0.5 q ha^{-1} for cluster 1, 0.1 q ha^{-1} for cluster 2,0.2 q ha^{-1} for cluster 3, 0.6 q ha^{-1} cluster 4, 0.1 q ha^{-1} for cluster 5 in toria variety TS38 & 1.5 q ha^{-1} in mustard variety PM28 respectively**.** The technology gaps recorded are ranged from 0.1to 1.5 q/ha which reflects the farmer's participation in conducting the demonstration. The variation in technology gap observed might be due to dissimilarity in soil fertility and management factors in the district.

Extension gap: The extension gap recorded in this study is 2.4 q ha^{-1}in cluster 1, 2.9 q ha^{-1} in cluster 2, 2.9 q ha^{-1} in cluster 3, 2.81 q ha^{-1}in cluster 4, 2.5 q ha^{-1} in cluster 5 in toria variety TS-38 & 3.1 q ha^{-1} in mustard variety PM-28 which is solely due to non adoption of high yielding varieties and delayed sowing (1st week of December).

Technology index: The lower value of technology index, higher is the feasibility of the improved technology. It was observed that the mean technology index of 5%, 1%, 2%, 6%, 1% and 12.5%was recorded in mega project programmes under the clusters 1, 2, 3, 4 & 5 respectively, which showed the efficacy of good performance of technical interventions.

Table 2: Influence of Mega project on rapeseed and mustard on yield, Technology gap, extension gap, technology index in Toria variety TS -38 and mustard variety PM-28

Cluster	Potential yield(q/ha)	Mega project(q/ha)		FP(q/ha)	% increase in yield over check	Tech gap (q/ha)	Extension gap (q/ha)	Technology index (%)
		TS-38	PM-28					
Kahibari (Bandia), Darrang	10	9.5	-	7.1	33.80	0.5	2.4	5
Borkumarpara (Punia), Darrang	10	9.9	-	7.0	41.42	0.1	2.9	1
Adhamapara	10	9.8	-	6.9	42.02	0.2	2.9	2
Chomuapara	10	9.4	-	6.6	42.42	0.6	2.81	6
Singimari	10, 12	:9.9,	10.5	7.4	33.78,41.89	0.1,1.5	2.5,3.1	1, 12.5

Other morpho physiological traits

Some other morpho physiological traits like plant height, no. of silliqua/plant, no. of pods/silliqua, date of sowing, date of harvesting, crop duration are also recorded and given in the below table.

Table 3: Morpho physiological traits

Cluster location (name of the village)	Mono/ double/ triple cropped area	Cropping sequence	Date of		Duration	Plant height (cm)	No. of silliqua/plant	No. of pods/pod	SAATHI registered area (Bigha)
			Sowing	Harvesting					
Kahibari (Bandia), Darrang	Double cropped area	Rice followed by toria	18.11.24	19.02.2024	91	93	190	18	-
Borkumarpara (Punia), Darrang	Double cropped area	Rice followed by toria	17.11.2024	18.02.2024	91	95	235	19	75bigha
Adhamapara	Double cropped area	Rice followed by toria	2.12.2024	2.03.2024	90	100	225	18	-
Chomuapara	Double cropped area	Rice followed by toria	30.11.2024	3.03.2024	90	98	179	16	-
Singimari	Double cropped area	Rice followed by toria	14.11.2024	27.02.2024	113	98, 125	245	20	-

Economics of the study

Economic study showed that in each of the cluster there is a higher net profit found as compared to the farmers practice. The details of the economic study was given in the table 4. below

Table 4: Economics of rapeseed-mustard under Mega project on Toria var. TS 38/PM-28 vs. farmers practice

Cluster	Area(ha)	No. of demo	Cost of Cultivation (Rs/ha)		Gross Return (Rs/ha)		Net Return (Rs/ha)		B.C ratio	
			cluster	FP	cluster	FP	cluster	FP	cluster	FP
Kahibari (Bandia), Darrang	10	25	19,100.00	18,750.00	53,675.00	40,115.00	34575.00	21,365.00	2.81	2.13
Borkumarpara (Punia), Darrang	10	25	19,100.00	18,750.00	55,935.00	39,550.00	36,835.00	20,800.00	2.92	2.10
Adhamapara	10	25	19,100.00	18,750.00	55,370.00	38,985.00	36,270.00	20,235.00	2.89	2.07
Chomuapara	2	7	19,100.00	18,750.00	53,110.00	37,290.00	34,010.00	18540.00	2.78	1.98
Singimari (TS-38)	1	18	19,100.00	18,750.00	55,935.00	41,810.00	36,835.00	23060.00	2.92	2.2
PM-28	7		19,100.00	18,750.00	59,325.00	41,810.00	40,225.00	23060.00	3.10	2.2

Photographs of the demonstration

Photographs of extension activities

Conclusion

At the end we can conclude that the HYV of toria/ mustard cultivated under the Mega project out yield the farmers practice in each of the cluster due to maintenance of proper time of sowing, use improved variety, use of correct doses of fertilizer and other inputs etc. It is concluded from the study that there exist a wide gap between the potential and demonstrated yield in mustard mainly due to technology and extension gaps and also due to the lack of awareness about the technology of mustard in Darrang district. Based on the analysis of data on Mega project conducted by KVK, Darrang, the results indicated that the project has given a positive and significant impact over the farming community as they were motivated by the new agricultural technologies applied in the demonstrations which were superior in every aspect compared to existing practices.

Acknowledgement

Authors are thankful to AAU-ZRS Shillongani, Nagaon, ICAR-DRMR, Bharatpur, Rajasthan DEE, Assam Agricultural University, Jorhat and Director, ATARI Guwahati for their valuable suggestions and timely allocation of fund to conduct the above study.

References

1. Samui SK, Maitra S, Roy DK, Mondal AK, Saha D. Evaluation on frontline demonstration on groundnut (*Arachis hypogaea* L.). J Indian Soc Coastal Agric Res. 2000;18(2):18-183.
2. Hiremath SM, Nagaraju MV, Shasidhar KK. Impact of frontline demonstration on onion productivity in farmer's field. Paper presented at: National Seminar on Appropriate Extension Strategies for Management of Rural Resources; 2007 Dec 18-20; Dharwad, India. p. 100.
3. Kumar A, Kumar R, Yadav VPS, Kumar R. Impact assessment of frontline demonstrations of bajra in Haryana state. Indian Res J Ext Educ. 2010;10(1):105-108.
4. Sarma SM, Ojah I, Khaund A, Das KB, Hafiz A. Yield enhancement of toria through cluster frontline demonstration in Darrang district of Assam. The Pharma Innovation J. 2024;13(4):41-44.
5. Amonge P, Bortahku S, Borah K, Saud RK. Impact of cluster frontline demonstration on bridging yield gap of toria (*Brassica campestris*) under rainfed condition in Tinsukia district of Assam. Int J Curr Microbiol Appl Sci. 2021;10(2):2797-2801.