ICAR-DRMR-OPIU(Agri.)-APART Project

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February - July 2023

ICAR-DIRECTORATE OF RAPESEED-MUSTARD RESEARCH
BHARATPUR, RAJASTHAN-321303

ASSAM AGRIBUSINESS & RURAL TRANSFORMATION PROJECT
(APART)

Six Monthly Progress Report-VI

February-July 2023

Consulting services for technical advisory support on Augmenting Rapeseed-Mustard Production of Assam Farmers for Sustainable Livelihood Security

Assam Agribusiness and Rural Transformation Project (APART)

Contract No. OPIU Agri/APART/DRMR/23/2020/57

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Table and Figures

Cont.

ACRONYMS	
AAU	Assam Agricultural University
AEA	Agricultural Extension Agent
ANMR	Additional Net Monetary Return
APART	Assam Agribusiness & Rural Transformation Project
ARIASS	Assam Rural Infrastructure and Agricultural Services Society
ATM	Assistant Technology Manager
ATMA	Agriculture Technology Management Agency
AWP	Annual Work-Plan
BPT	Barpeta
BNGN	Bongaigaon
B:C Ratio	Benefit: Cost Ratio
BTM	Block Technology Manager
BVZ	Barak Valley Zone
CBVZ	Central Brahmaputra Valley Zone
CoC	Cost of Cultivation
CD	Crop Demonstrations
DBRI	Dhubri
DNR	Darrang
DMJ	Dhemaji
DRMR	Directorate of Rapeseed-Mustard Research
DoA	Department of Agriculture
FP	Farmers' practices
GDP	Gross Domestic Product
GLGT	Golaghat
GMR	Gross Monetary Return
Ha	Hectare
HZ	Hills Zone
ICAR	Indian Council of Agricultural Research
ICT	Information and Communication Technology
YIOFP	Yield Increase over Farmers' Practice
IP	Improved practices/technologies
IMD	India Meteorological Department
INM	Integrated Nutrient Management
INR	Indian Rupee
IPM	Integrated Pest Management
KMPR	Kamrup
KOJ	Kokrajhar
KVK	Krishi Vigyan Kendra
LBVZ	Lower Brahmaputra Valley Zone
LKMP	Lakhimpur
MOG	Morigaon
MT	Master Trainer
NAV	Nagaon
NBPZ	North Bank Plain Zone
NEH	North East Hills
NER	North Eastern Region
NLB	Nalbari
PHM	Postharvest Mechanization
SNTR	Sonitpur
SBS	Sivsagar
ToT	Training of Trainers
TT	Technical Training
UBVZ	Upper Brahmaputra Valley Zone

Preface

Oilseed crops are the second most important determinant of agricultural economy, next only to cereals. Today, the demand for vegetable oils is out pacing the supply with more than half of its annual requirements being met mainly through imports.

Enhancing the domestic edible oil availability is one of the prime concerns of the policy planners to check the rising edible oil imports. Rapeseed-mustard is one of the important sources of edible oil in the country which has made a significant contribution to domestic edible oil availability over the last few decades. Rapeseed-mustard crop has good production potential, where the cultivation is supported with technology and knowledge inputs.

Over the last decade, the number of rapeseed-mustard technologies have been developed, but for certain proven technologies there is a profound adoption gap particularly among smallholder farmers. Increased technology adoption, broadly defined to include adoption of improved agricultural practices, crop varieties, inputs and associated products has the potential to contribute to economic growth through increasing production and productivity of rapeseed-mustard.

Crop area expansion, either through inter cropping or spreading the crop in rice fallow land in the country may also help in increasing the production of rapeseed-mustard. Rapeseed- mustard is grown in substantial area in Assam. However, low and unstable oilseed system productivity is major problem in these areas where cultivation is undertaken mostly on small and marginal agricultural holdings. Keeping in view the vast availability of natural resources and fertile lands offering ample scope to promote oilseed cultivation in Assam, there is an urgent need to identify/screen the suitable technologies of rapeseed-mustard production for rice–fallow situation and motivate the farmers of these areas to adopt identified technologies through demonstrations, trainings, fairs, exhibitions and visits to research and experimental farm.

With this background, ICAR-DRMR is contributing for enhancing rapeseed-mustard production in Assam through a project on “Consulting services for technical advisory support on augmenting rapeseed-mustard production of farmers of Assam for sustainable livelihood security” since April 28, 2020. ICAR-DRMR as a knowledge partner is providing the expertise under the project to support the Directorate of Agriculture, Govt. of Assam for

a) Enhancing adoption of high yielding short duration rapeseed-mustard varieties
b) Enhancing area and raising productivity, profitability, and resource use efficiencies of rapeseed-mustard cultivation in Assam through improved crop management and protection technologies.
c) Strengthening post-harvest management, reduce losses, increase efficiency and profitability, and improve mustard value chain
d) Developing knowledge materials and capacity development of various stakeholders and extension functionaries in Assam.

The activities under the project were carried out in seven undivided districts namely; Jorhat, Sivsagar, Golaghat, Sonitpur, Morigaon, Darrang and Dhubri of Assam during 2020-21. The results of demonstrations were very encouraging and technology dissemination through various programmes was effective and created interest and motivation in the farmers to adopt the scientific rapeseed-mustard production technologies in larger area. The results also invigorated the policy makers for expanding the scope of the project in new districts of Assam. After having long deliberation with all stakeholders, it was mutually agreed between ICAR-DRMR and Directorate of Agriculture to expend

the project activities in additional districts namely; Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup, Lakhimpur, Dhemaji, Nagaon and Tinsukia of Assam with additional number of demonstrations and other activities for next three years (2021-22 to 2023-24). In this regard, a contract variation in "Consulting services for technical advisory support on augmenting rapeseed-mustard production of Assam farmers for sustainable livelihood security" was signed on 21-10-2021 between Director, Directorate of Agriculture, Khannapara, Guwahati, Govt. of Assam and Director, ICAR-Directorate of Rapeseed-Mustard Research, Bharatpur, Rajasthan. ICAR-DRMR is satisfied with the amount of cooperation and support received from DoA, APART, ARIAS society/ DAO and Nodal officers/ ATM/BTM of districts *vice versa*. It is really an interesting and enriching experience for ICAR-DRMR to work with the dedicated team of DoA, APART, ARIAS society during the implementation of the programme

Keeping in view the low productivity, poor marketing support and low confidence and capacities of the value chain actors, ICAR-DRMR believes that interventions with regards to organizing crop demonstrations along with technical trainings, PHT demonstrations, and training and capacity building of the value chain actors is critical for enhancing the production and productivity of rapeseed-mustard in Assam. Therefore, ICAR-DRMR is working with the Director of Agriculture, Government of Assam on the mustard value chains especially on organizing demonstrations, and training & capacity building programmes to increase the average productivity of rapeseed-mustard.

Other interventions in the mustard value chain are development of knowledge materials in the form of simple and actionable farmer-friendly extension material and digital/IT tools on the different aspects of scientific production and protection technology of mustard to reach a large number of farmers quickly and simultaneously at a low cost and provide accurate, motivating, credible and distortion free information to them. To create awareness among farmers about varieties, technologies, practices in the mustard value chain including post-harvest and market linkages, ICAR-DRMR is providing technical support to organize farmer fairs.

To reinforce the confidence of the extension personnel and farmers in new technologies, methods, etc., exposure visit of extension functionaries and farmers are being organized to ICAR-DRMR along with interaction with progressive farmers and visit to farmers' field in Bharatpur and surrounding areas, to have better knowledge and understanding of technology, methods and to improve the skills of the extension personnel and farmers in scientific production and protection technology of rapeseed-mustard.

ICAR-DRMR will also support in organizing a round table conference/workshop/ seminar to gain further insight into opportunities in Assam and to include and identify all mustard value chain actors from the agro-system (farmers to consumers).

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Executive summary

Under the ICAR-DRMR OPIU (Agri)-APART project, 15 districts of Assam namely; Golaghat, undivided Jorhat including Majuli, Sivasagar, Darrang, Sonitpur, Morigaon, Dhubri Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup, Lakhimpur, Dhemaji and Nagaon were selected to implement and organization of approved activities during 2022-23. For better supervision, monitoring, efficient delivery and effective implementation of mustard activities, ICAR-DRMR has deployed its team at all fifteen districts.

During 2022-23, 5000 mustard crop demonstrations were approved. Accordingly a total of 5000 mustard crop demonstrations in 896 villages of 67 clusters of 15 districts were laid out. Along with mustard crop demonstrations, 18000 minikit demonstrations in the selected clusters to strengthen mustard value chain- production were also laid out. In each minikit, one Kg seed was provided to each farmer to compare it with other existing varieties.

Based on the climatic situation, cultivation of rapeseed-mustard, prevailing cropping pattern and resources, these demonstrations were conducted with three improved varieties of Indian mustard viz. NRCHB-101 (547), PM-28 (1385) and DRMR-150-35 (1081) and one variety of toria, viz. TS-38 (1987) along with crop management and protection technologies like line sowing, proper seed rate, seed treatment, proper plant population, thinning, weeding, intercultural operations, management of pest and diseases, etc. against the control plot. The seed of these improved varieties were supplied by ICAR-DRMR to DAOs / PD ATMA of 15 selected APART mustard districts. The seed was made available to them timely. The seed of demonstrated variety along with required fertilizers and need based fungicides/pesticides were given to selected farmers for crop demonstration. Under minikit demonstrations, only one kg seed of improved varieties viz. DRMR-150-35 (8070) and PM-28 (6930) of Indain mustard and one variety of toria, viz. TS-38 (3000) were supplied to the farmers.

These crop demonstrations were distributed for different social categories as 1984 (Gen), 1311 (OBC), 517 (SC) and 1188 (ST) beneficiaries. Out of 5000 demonstrations conducted, 4890 crop demonstrations were successful, whereas a total of 110 crop demonstrations (51 of PM-28, 29 of DRMR-150-35, 20 of TS-38 and 10 of NRCHB-101) were failed in different districts due to poor germination, cattle grazing, drought, hail storms, etc. All 4890 successful crop demonstrations were conducted in different situations viz. Irrigated (538) and rainfed (4352) situations during 2022-23.These demonstrations were harvested successfully in Feb.-March 2023 and yield data were analyzed to study the performance of demonstrated technologies.

The performance of crop demonstrations across the districts in both situation viz. irrigated and rainfed condition shows that mean seed yield from IP ranged from 869 (Sivsagar) to 1235 kg/ha (Dhubri), whereas from FP ranged from 544 (Sivsagar) to 755 kg/ha (Sonitpur). The yield increase due to IP ranged from 41.43 % in Lakhimpur to 84.60% (Dhubri) (Fig.6). The cost of cultivation of IP ranged from Rs. 20602 (Dhubri) to Rs 28224/ha (Sonitpur), while for FP it ranged from Rs. 15191 (Dhubri)) to Rs 23752 /ha (Jorhat). The maximum additional cost Rs. 6583/ha for IP incurred (Sonitpur), while minimum Rs. 2173/ha (Kamrup). The maximum ANMR of Rs 25436 /ha was reported due to the improved practices in Dhubri, while minimum of Rs 8381 /ha was in Kokrajhar. All IP had positive ANMR (Table 7).The Gross Monetary Return for IP ranged from Rs. 47361/ ha in Sivasagar to Rs. 67308/ha in Dhubri, while in FP ranged from Rs. 29648/ha in Sivasagar to Rs 41148/ ha in Sonitpur. The B:C ration for IP ranged from 1.90 (Nalbari) to 3.26 (Dhubri), while for FP it ranged from 1.44 (Sivsagar) to 2.40 (Dhubri). The higher gross monetary return (GMR) and B:C ratio of

demonstrated technology and positive additional net monetary return (ANMR) in all districts evidently show that demonstrated technology of rapeseed-mustard during 2022-23 was economically viable and profitable for the farmers of Assam.

Regular visits and monitoring of the crop demonstrations and minikit demonstrations were done by Research Associates and ATMA personnel to educate and motivate the farmers to adopt crop management practices like thinning, intercultural operations, weeding, applying irrigation, management of insect pests and diseases, etc.

A total of 250 field days were organized in fifteen selected districts at maturity stage during Feb.-March 2023 at the demonstrated fields of selected farmers. A total of 7009 farmers and farm women participated in these field days.

A total of 45 PHT demonstration trainings were organized in fifteen selected districts during Feb.-June 2023. A total of 1273 farmers and farm women participated in these 45 PHT demonstration trainings.

A farmer fair was organized in the premises of old agriculture office of Morigaon district of Assam on April 25, 2023. More than 100 farmers, farm women and extension personnel from different districts of Assam participated in the fair.

A conference on Buyer-Seller Meet was organized at Krishi Vigyan Kendra, Kahikuchi Campus, Kamrup on April 27, 2023. Around 85 sellers and buyers or FPC shareholder participated in the programme.

The details of the targets and achievements of the activities are presented in Table 1.

Table 1: Executive summary of physical targets and achievements during February-July 2023 as per AWP 2022-23.

Activities	Unit	Target	Achievement	Remarks
Crop Demonstrations	No.	5000	5000	Completed
Minikit demonstrations	No.	18000	18000	Completed
Field days	No.	250	250	completed
PHT demonstrations	No.	45	45	Completed
Farmers Fair	No.	1	1	Completed
Conference on Buyer-Seller Meet	No.	1	1	Completed

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Chapter 1: Detailed Report

1.1 About ASSAM

Assam, a state with a geographical area of 78,438 km^2, forms about 2.4% of the country's total geographic area and is the core of the North Eastern Region (NER) of India. It is situated in the South of the Eastern Himalayas, between 89°42′ E to 96°E longitude and 24°8′ N to 28°2′ N latitude. A large part of Assam is surrounded by hilly areas and it has both National as well as International boundaries. Assam shares its north boundary with Bhutan and Arunachal Pradesh. Nagaland, Manipur and a part of Arunachal Pradesh are to the east of Assam while Mizoram is to the south of it. States Tripura, Meghalaya and the country Bangladesh are situated to the south-west of the state and West Bengal is to the west of it. Assam comprises three broad natural divisions, namely, the Brahmaputra valley, the Barak valley, and the Hill range. The Brahmaputra valley is the largest strip of plain land extending from the West to North-East in the northern part of the state. The river is the main source of life for the people of Assam and a contributing factor for the fertile agricultural land of the state. Adding quality to alluvial soil, the river Brahmaputra is a perennial source of water for the state.

The southern part of the state is another valley with the river Barak passing through it, known as the Barak valley. This region is relatively small and accounts for only about 9% of the area of the state, accommodating about 12% of the state's population. The hilly range of Karbi Anglong and North Cachar lies in the middle of the state, separating the two valleys.

1.2: Agro-climatic Zones

Based on the amount and characteristics of rainfall, temperature, relative humidity, terrain condition (a stretch of land with regard to its natural features), and soil characteristics, Assam has been broadly divided into six agro-climatic regions as shown in fig 1. They are:

1. The North Bank Plain Zone (NBPZ), comprises of the districts Dhemaji, Lakhimpur, Sonitpur, Udalguri (BTAD) and Darrang, contributing to 18.37% area of Assam. Rice, Rapeseed-Mustard and Sugarcane are the major crops of the zone.
2. The Upper Brahmaputra Valley Zone (UBVZ), comprises of the districts Tinsukia, Dibrugarh, Sivasagar, Jorhat, and Golaghat, and accounting for 20.40% of the total area of Assam. Rice, Rapeseed-Mustard and Sugarcane are the major crops of the zone.
3. The Central Brahmaputra Valley Zone (CBVZ) comprises of the districts Nagaon and Morigaon, accounting for only 7.08% of the area of the state. This region is bowl-shaped and often flooded. Rice, Rapeseed-Mustard, Jute and Pulses are the major crops of the zone
4. The Lower Brahmaputra Valley Zone (LBVZ) comprises of the districts Kamrup, Nalbari, Barpeta, Bongaigaon, Kokrajhar, Chirang, Baksa, Dhubri, and Goalpara covering an area of 20,222 km2, accounting for 25.75% of the area of the state. Rice, Rapeseed-Mustard, Jute, Potato, Wheat and Pulses are the major crops of the zone
5. The Barak Valley Zone (BVZ) comprises of the districts Cachar, Hailakandi, and Karimganj and covers a total area of 6,962 km2, i.e., 8.9 % area of the state. Rice, Sugarcane and Potatoare the major crops of the zone
6. The Hills Zone (HZ) comprises of two districts Karbi Anglong and North Cachar Hills, encompassing 19.4% of the total state area. Maize and Sugarcane are the major crops of the zone.

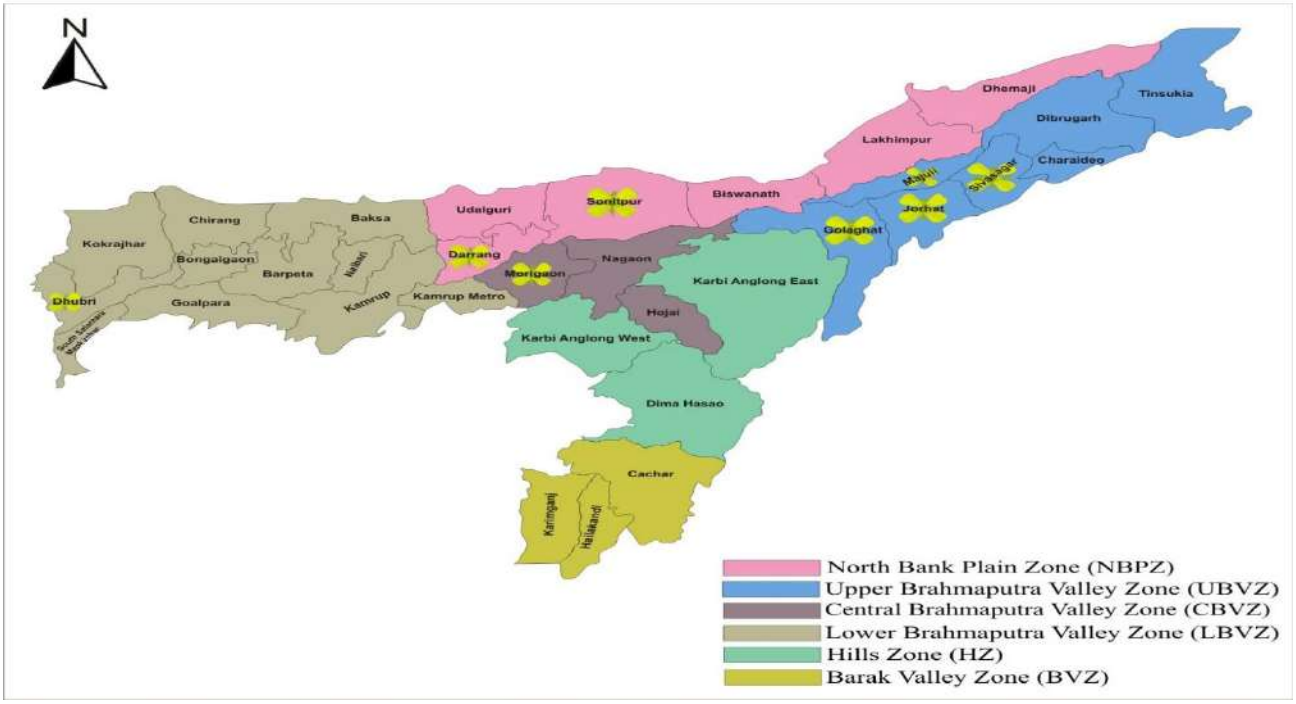

Fig 1: Agro-climatic Zones of Assam

There is a similarity of farm operation in the first five plain agro-climatic zones of Brahmaputra valley and Barak valley. The method of cultivation adopted in the plain region of Assam is more or less similar to that followed in most parts of India. Rice, grown during the wet season (June-Oct/Nov) also called Sali /winter rice, has traditionally been the principal crop in all these zones. Moreover, jute is also grown during the same period at a substantial scale. During the winter months when rainfall is scanty, and the scale of cultivation is also much smaller, the less water requiring crops, such as oilseeds, pulses, potato, and vegetables are traditionally grown in the plains. On the other hand, the system of farming in the hilly areas is significantly different from the system of farming in the plains. The primitive practice of shifting cultivation is still predominant mode of cultivation in the hills.

Climatic Condition: Generally Assam's climate comprises very wet summer season and sunny winter season. The monsoon rain normally starts from early June and continues up to the month of October. Moreover, in late April and May, normally there is also heavy pre-monsoon rain in the state. In Assam, during the summer, temperature normally varies between 25^{o} C and 40^{o} C. During the winter period, i.e., from the month of November to the February, climate mostly remains dry. Sometimes, the temperature during the winter falls bellows 5^{o} C.

The state normally witnesses a very heavy rainfall during the period from June to September. As opposed to monsoon season, the state witnesses on an average 51.0 millimeter rainfall during the winter season. Again in summer and post monsoon period, the average rainfall is 578.00 and 176.00 millimeter, respectively. The average rainfall in the state in a year is 2294 millimeter.

Sources of Irrigation: The major sources of irrigation in Assam are canal, tube well, tank and well supplying irrigation.

1.3: Brief description of the districts identified for rapeseed-mustard programme under the project

For the rapeseed-mustard programme under APART project from 2022-23 onward, fifteen districts of Assam namely; 15 districts of Assam namely; Golaghat, undivided Jorhat including Majuli, Sivasagar, Darrang, Sonitpur, Morigaon, Dhubri Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup, Lakhimpur, Dhemaji and Nagaon were selected. For better supervision, monitoring, efficient delivery and effective implementation of mustard activities of APART, ICAR-DRMR has deployed its team at all fifteen district locations. The selected districts belong to different Agro-climatic zones of the state as follows:

Districts for rapeseed-mustard programme	**Agro-climatic zone of Assam**
Jorhat, Golaghat and Sivasagar	Upper Brahmaputra Valley Zone
Dhemaji, Lakhimpur, Sonitpur and Darrang	North Bank Plain Zone
Nagaon and Morigaon	Central Brahmaputra Valley Zone
Kamrup, Nalbari, Barpeta, Bongaigaon, Kokrajhar and Dhubri	Lower Brahmaputra Valley Zone

Normally, there are considerable variations in physiography, climate, soils, flooding and cropping pattern etc. in an agro-climatic zone and these variations lead to formation of agro-ecological situations within the zone.

Barpeta: This district comprises of 264500 ha area, having 11 blocks. Total cropped area of the district is 249307 ha. and paddy, Jute, maize, seasamum and rapeseed and mustard, potato, lentil, linseed, wheat and rabi vegetables are the major crops. The district is considered as normal / flood prone having sandy soil. About 18,850 ha ha area is under mustard crop and aphids and mustard

sawfly are the major pest of mustard in the district. The major cropping pattern are sali paddy–mustard–summer paddy sali paddy–potato–summer paddy. Lack of appropriate variety for rice and mustard, pest and disease problems, shortage of agriculture implements are the major constraints with respect to agriculture. The Bajali, Bhawanipur, Barpeta, Chenga, Pakabethbari, Sarukhetri, Mandia, Chakachaka, Rupshi, and Gumafulbari blocks of district have been selected for project activities.

Bongaigaon: This district comprises of 172592 ha area, having 5 blocks. Total cropped area of the district is 1,17,685 ha. and paddy, jute, black gram and kharif vegetables, rapeseed and mustard, maize, potato, lentil, wheat and rabi vegetables are the major crops. The district is considered as flood prone having alluvial soil. About 8,487 ha area is under mustard crop aphids, and sawfly are the major pest of mustard in the district. The major cropping pattern are sali paddy – mustard – summer paddy, sali paddy – potato – summer paddy and sali paddy – maize – summer paddy. lack of appropriate high yielding variety for rice and mustard, pest and disease problems and shortage of agriculture implements in farmers the major constraints with respect to agriculture. The Manikpur, Patiladoha and Bidyapur blocks of district have been selected for project activities.

Darrang: This district comprises of 158500 ha area, having 6 blocks/clusters. Total cropped area of the district is 73619 ha and paddy, maize, vegetable and mustard are the major crops. The district is considered as sandy loam and clay loam soil. About 15447 ha area is under mustard crop and aphid, white rust and saw fly are the major pest and disease of mustard. The major cropping patterns are sali paddy–maize-vegetable, sali paddy- mustard. Late sowing of sali paddy, laggard to new technology and flood are the major constraints with respect to agriculture. The Bechimari, Sipajhar and Pachim Mangaldai clusters of district have been selected for project activities.

Dhemaji: This district comprises of 3,23700 ha area, having 5 blocks. Total cropped area of the district is 2,02,730 ha. paddy maize, rapeseed and mustard, potato, Blackgram, turmeric and arecanut, are the major crops. The district is considered as flood prone having sandy loam. About 22,456 ha area is under mustard crop aphids, mustard sawfly, bihar hairy caterpillar, pea leaf are the major pest of mustard in the district. The major cropping pattern are sali rice - ahu rice - toria, rice-vegetables and rice- fallow. Flood, non-availability of quality seeds at right time, non- adoption of modern technology, non-availability of input dealers, pests and diseases infestations, improper use of fertilizer and chemicals, lack of knowledge of production technology are the major constraints with respect to agriculture. The Sissiborgaon, MSTD and Machkhowa blocks of district have been selected for project activities.

Dhubri: This district comprises 2,36,126 ha. area, having 11 blocks/ cluster. Total cropped area of the district is 2,30,536 ha and paddy, kharif vegetables, black gram, maize, jute, potato, rapeseed-mustard, and pea are the major crops. The district is considered as sandy loam and clay loam. About 23471 ha area is under mustard crop. The major cropping patterns are mustard –boro paddy, sali paddy-rapeseed /mustard/ rabi vegetables/ rice-pumpkin/potato/mustard. The occurrences of flood and water stress, attack of insect pests such as aphids, powdery mildew, early shower during harvesting, non-availability of fertilizers and chemicals during peak seasons etc. are the major constraints with respect to agriculture. The Gauripur, Rupshi, Agomani, Chapar-Salkocha and Mahamaya clusters of district have been selected for project activities.

Golaghat: This district comprises of 350200 ha area, having 8 blocks/clusters. Total cropped area of the district is 2,28325 ha and paddy, banana, pineapple, ginger, chilli tomato, sugarcane, potato, rapeseed-mustard, pea, lentil, green gram, maize and vegetable are the major crops. The district is considered as sandy loam and clay loam soil. About 13450 ha area is under mustard crop and aphid, white rust and saw fly are the major pest and disease of mustard in the district. The major cropping patterns are sali rice-rabi vegetables / rapeseed-mustard / black grams, sali rice-summer paddy and summer paddy-black gram / rapeseed-mustard / rabi vegetables. The occurrences of flood and water stress, attack of insect pests such as aphid, early shower during harvesting, non-availability of

fertilizers and chemicals during peak seasons etc. are the major constraints with respect to agriculture. The Bokakhat, Kakodonga and Podumoni clusters of district have been selected for project activities.

Jorhat undivided including Majuli: This district comprises of 192862 ha area, having 8 blocks. Total cropped area of the district is 102839.2 ha and rice, paddy, pea, pulse, cabbage, cauliflower, brinjal and mustard are the major crops. The district is considered as flood prone having sandy loam soil. The 91% area is under rainfed and only 9% cropped area is covered by tube well irrigation. About 9507 ha area is under mustard crop and aphid and saw fly are the major pest of mustard in the district. The major cropping pattern are paddy- vegetables-vegetables, paddy-potato-vegetables, paddy-pulse-paddy-mustard. The occurrence of flood and sometimes drought in summer are the major constraints with respect to agriculture. The Kaliapani, Majuli, Ujani block of district were selected for project activities.

Kamrup: This district comprises of 4,34,500 ha area, having 22 blocks. Total cropped area of the district is 2,07,344 ha. and paddy, mustard, maize, fruit crops i.e. Banana, and vegetables are the major crops. The district is considered as flood prone having clay loam, sandy loam, sandy soil, alluvial soil and red soil. The 81% area is under rainfed and only 19% cropped area is covered by irrigation. About 15820 ha area is under mustard crop and aphid and saw fly are the major pest of mustard in the district. The major cropping pattern are sali paddy-vegetable-rapeseed and mustard, sali paddy-mustard, sali paddy-boro paddy, fallow (summer)- vegetable/ Mustard, Summer vegetable-toria/ rabi vegetables. The Insect pest and disease, labour constraints, unseasonal rain/ weather constraints, non-availability of improved variety on time, lack of irrigation facilities, and lack of scientific knowledge on crop production are the major constraints with respect to agriculture. The Kamalpur, Bihdiya-Ajikona, Bongshor and Chandrapur blocks of district have been selected for project activities.

Kokarajhar: This district comprises of 3,16,900 ha area, having 4 blocks/clusters. Total cropped area of the district is 1,55,276 ha and paddy, maize, rapeseed and mustard, potato, are the major crops. The district is considered as sandy loam. About 23873 ha area is under mustard crop and aphid, white rust and saw fly are the major pest and disease of mustard in the district. The major cropping patterns are mustard-summer paddy/sali paddy- mustard- summer paddy/ sali paddy- vegetables-ahu paddy. The occurrences of flood and water stress, attack of insect pests such as aphid, early shower during harvesting, non-availability of fertilizers and chemicals during peak seasons etc. are the major constraints with respect to agriculture. The Kokrajhar, Dotma and Kachugaon clusters of district have been selected for project activities.

Lakhimpur: This district comprises of 2,27700 ha. area, having 9 blocks. Total cropped area of the district is 2,17,222 ha. and winter paddy, summer rice, rapeseed and mustard, potato, blackgram, arecanut and banana, are the major crops. The district is considered as flood prone having alluvial soil. About 15820 ha area is under mustard crop and aphids, mustard sawfly, bihar hairy caterpillar, Pea leaf miner, powdery mildew, sclerotinina rot, alternaria leaf spot, white rust are the major pest of mustard in the district. The major cropping pattern are Winter Rice-Rape & Mustard, Winter Rice-Potato, winter rice-Summer paddy. Non-availability of seeds at right time, low adoption of early maturing varieties, late sowing, pests and diseases infestations the major constraints with respect to agriculture. The Telahi, Dhakuakhana, Ghilamora, Narayanpur and Dhakuakhana blocks of district have been selected for project activities.

Morigaon: This district comprises of 155100 ha area, having 5 blocks. Total cropped area of the district is 214921 ha. and rice, mustard and maize are the major crops. The district is considered as flood prone having sandy loam soil. The 75% area is under rainfed and only 25% cropped area is covered by tube well irrigation. About 12546 ha area is under mustard crop and aphid and saw fly are the major pest of mustard in the district. The major cropping pattern are Sali Rice-Mustard-Summer Pulses and Sali Rice-Mustard-Jute. The occurrence of flood and sometimes drought in summer are

the major constraints with respect to agriculture. The Mayong and Bhurbandha block of district have been selected for project activities.

Nagaon: This district comprises of 260879 ha area, having 13 blocks. Total cropped area of the district is 151744 ha. and paddy, mustard and maize are the major crops. The district is considered as flood prone having sandy loam soil. The 70% area is under rainfed and only 30% cropped area is covered by tube well irrigation. About 27236 ha area is under mustard crop and aphid and saw fly are the major pest of mustard in the district. The major cropping pattern are jute- rice-toria/ wheat - summer pulses and cowpea - rice- toria. The irrigation facilities, non-availability of improved variety at the sowing time, lack of knowledge about pests and disease management, fragmented land of farmers, lack of knowledge about soil condition and fertilizer application are the major constraints with respect to agriculture. The Raha, Khagorijan, Koliabor, Batadrava blocks of district have been selected for project activities.

Nalbari: This district comprises of 100957 ha area, having 7 blocks. Total cropped area of the district is 1,03,231 ha. paddy, maize, rapeseed and mustard, potato, vegetables are the major crops. The district is considered as flood prone having clay, loamy and sandy. About 8020 ha area is under mustard crop aphids and mustard sawfly are the major pest of mustard in the district.The major cropping pattern are, sali paddy- mustard- summer paddy, sali paddy- vegetables -ahu paddy and jute-mustard-summer paddy. Non-availability of improved variety on time, non-availability of fertilizers on time and lack of knowledge about pests and disease scenario and management of the same are the major constraints with respect to agriculture. The Barkhetri and Borigog-Banbhag block of district have been selected for project activities.

Sivasagar: This district comprises of 159885 ha area, having 5 blocks/ clusters. Total cropped area of the district is 1, 16,579 ha and rice, maize, pulses, jute, sugarcane, potato and mustard are the major crops. The district is considered as alluvial soil, clay loam and sandy loam soil. About 2,750 ha area is under mustard crop and aphid and saw fly are the major pest of mustard in the district. The major cropping pattern are rice-mustard, rice-vegetables, mustard-kharif vegetables. The occurrences of water stress, early shower during harvesting, dense foggy during the month of November are the major constraints with respect to agriculture. The Demow and Gaurisagar clusters of district have been selected for project activities.

Sonitpur: This district comprises of 271729 ha area, having 7 blocks/cluster. Total cropped area of the district is 112281 ha and rice, maize, pulses, jute, sugarcane, potato and mustard are the major crops. The soil is clay loam and sandy loam. The 91 % area is under rainfed and only 9% cropped area is covered by tube well irrigation. About 15501 ha area is under mustard crop and aphid and saw fly are the major pest of mustard in the district. The major cropping pattern are rice-mustard, rice-vegetables, mustard-kharif vegetables. The occurrence of flood, soil erosion, non-adoption of line transplanting are the major constraints with respect to agriculture. The Gabhoru, Balipara, Bihaguri, Chaiduar Dhekiajuli, Rangapara and Biswanath clusters of district have been selected for project activities.

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1.4: Weather

The climate of Assam is typically 'tropical monsoon rainfall' type, with high levels of humidity and heavy rainfall. In the monsoon season, the whole state comes alive with the beauty of nature. Assam is well known for its diverse sub-Himalayan agro-climatic conditions, which is suitable for the growth of varieties of crops across the districts. The climate varies slightly from region to region within the state. While the plains of Assam have tropical climate with high humidity, the hills have a sub-alpine type climate. Across the state, the average minimum and maximum temperature were recorded 18^0C and 29^0C in the month of January and June 2023 respectively.

Weather parameters play major role in determining the crop growth, development and yield because weather strongly influences the physical expression of genetic potential of the crop. Any significant deviation of this parameter from the optimum value become detrimental for the crop productivity. Weather has direct effect on growth and development of plants. All the physio-chemical and biological activities of the plants are governed by the weather variables prevailing in the area. In case of rapeseed-mustard, maximum temperature plays an important role for germination of crop in late October to second week of November. If the maximum temperature during this period remains low (27-35ºC), the germination of the seed is not affected.

1.4.1. Upper Brahmaputra Valley Zone (UBVZ).

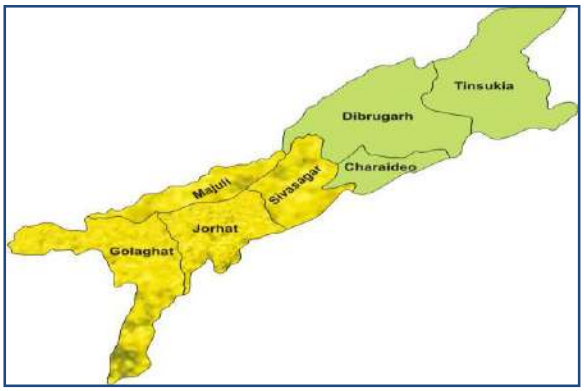


Figure 2 shows the monthly maximum minimum temperature, rainfall and number of rainy days in the Upper Brahmaputra Valley Zone (UBVZ). The analysis of the temperature profile during January to June 2023 in the zone shows that the average maximum temperature was 28 ^{0}C (ranged from 24.1 to 31.9 ºC) and average minimum temperature was 17^0C (from 8.7 to 23.9) ºC. The minimum 40.5 mm and maximum 344.1 mm rainfall were recorded in the months February and June 2023 respectively. In the Zone, the maximum 16 rainy days were recorded in the month of June 2023.

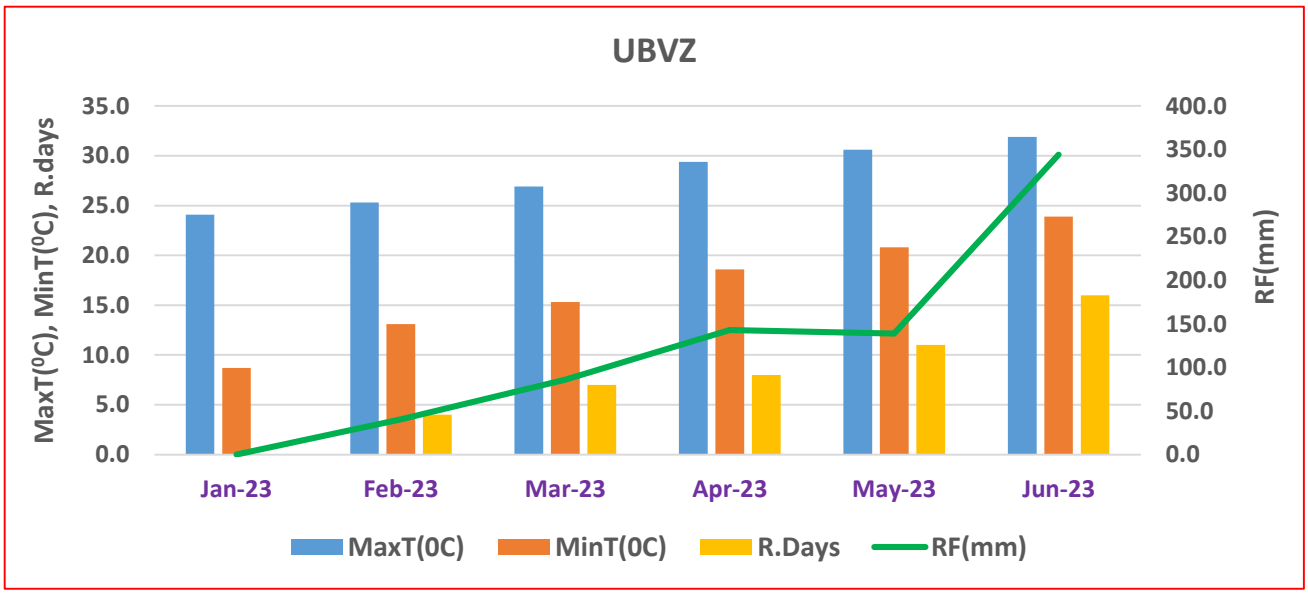


Fig 2: Maximum & Minimum temperature and rainfall in UBVZ

1.4.2. Central Brahmaputra Valley Zone (CBVZ).

Figure 3 shows the monthly maximum, minimum temperature and rainfall in the Central Brahmaputra Valley Zone （CBVZ）. The analysis of the temperature profile during January to June 2023 in the zone shows that the average maximum temperature was 29 ^{0}C (ranged from 24.8 to 33.3 ºC) and average minimum temperature was 18^{0}C (from 11.1 to 24.5) ºC. The minimum 21.3 mm and maximum 277.1 mm rainfall were recorded in the months February and June 2023 respectively. In the Zone, the maximum 17 rainy days were recorded in the month of June 2023.

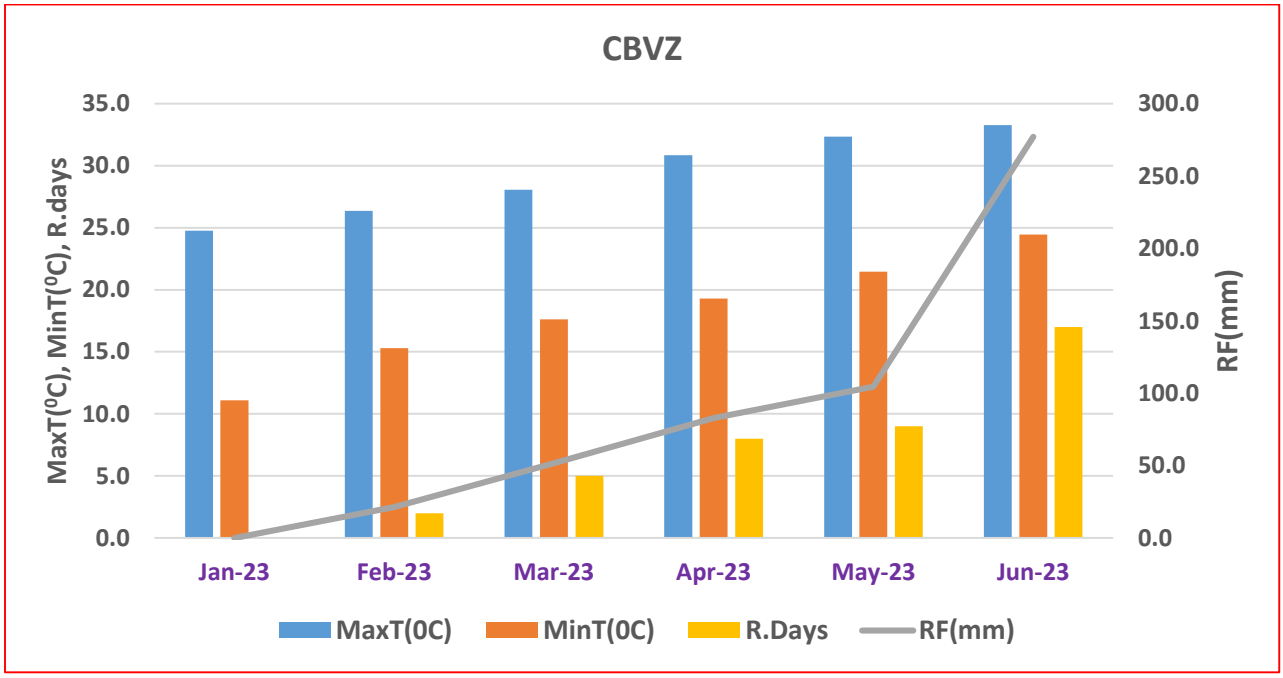


Fig 3: Maximum & Minimum temperature and rainfall in CBVZ

1.4.3. Lower Brahmaputra Valley Zone（LBVZ）.

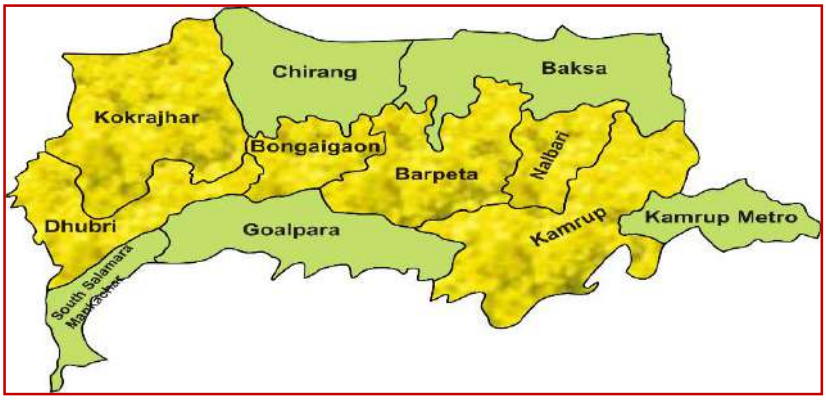


Figure 4 shows the monthly maximum, minimum temperature, rainfall and number of rainy days in the Lower Brahmaputra Valley Zone（LBVZ）. The analysis of the temperature profile during January to June 2023 in the zone shows that the average maximum temperature was 30 ^{0}C (ranged from 24.8 to 31.5ºC) and average minimum temperature was 17^{0}C (from 7.7 to 24.3) ºC. The minimum 5.9 mm and maximum 1235.4 mm rainfall were recorded in the months February and June 2023 respectively. In the Zone, the maximum 18 rainy days were recorded in the month of June 2023.

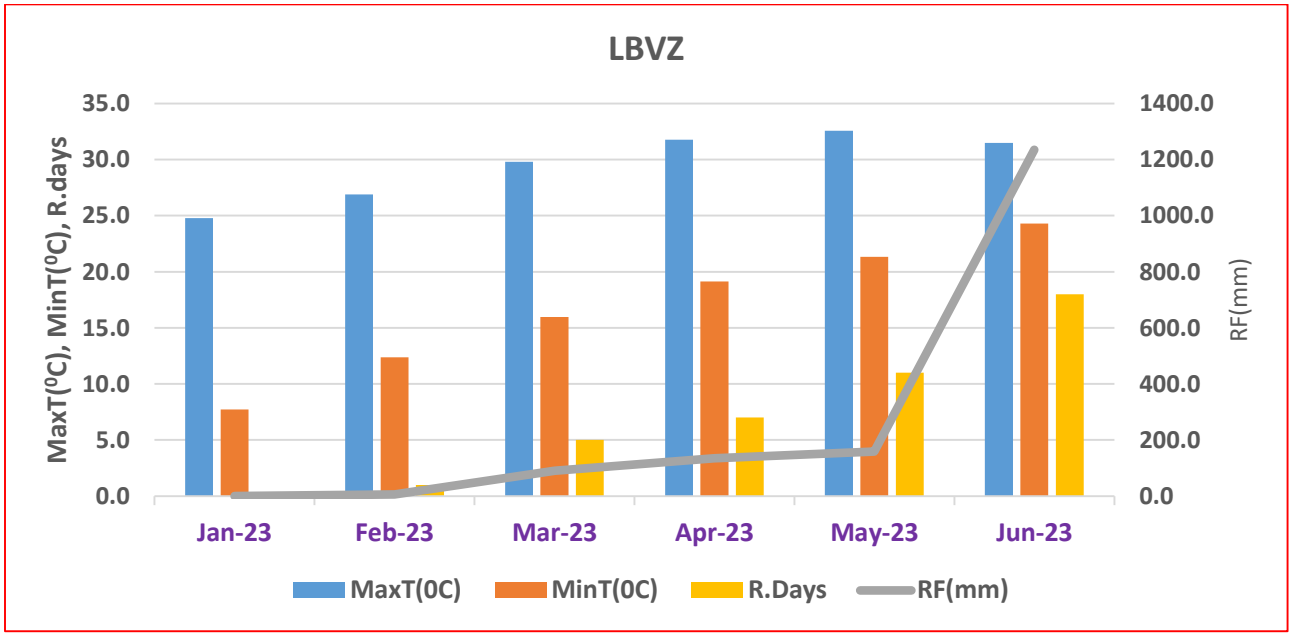


Fig 4: Maximum & Minimum Temperature and Rain fall in LBVZ

1.4.4. North Bank Plain Zone（NBPZ）.

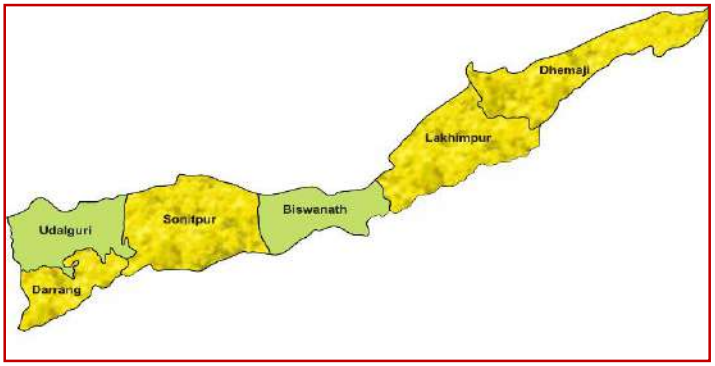


Figure 5 shows the monthly maximum minimum temperature and rain fall in the North Bank Plain Zone（NBPZ）. The analysis of the temperature profile during January to June 2023 in the zone shows that the average maximum temperature was 29 ^{0}C (ranged from 25 to 32.2ºC) and average minimum temperature was 18^{0}C (from 8.9 to 24.5) ºC. The minimum 34.6 mm and maximum 500.2 mm rainfall were recorded in the months February and June 2023 respectively. In the Zone, the maximum 20 rainy days were recorded in the month of June 2023.

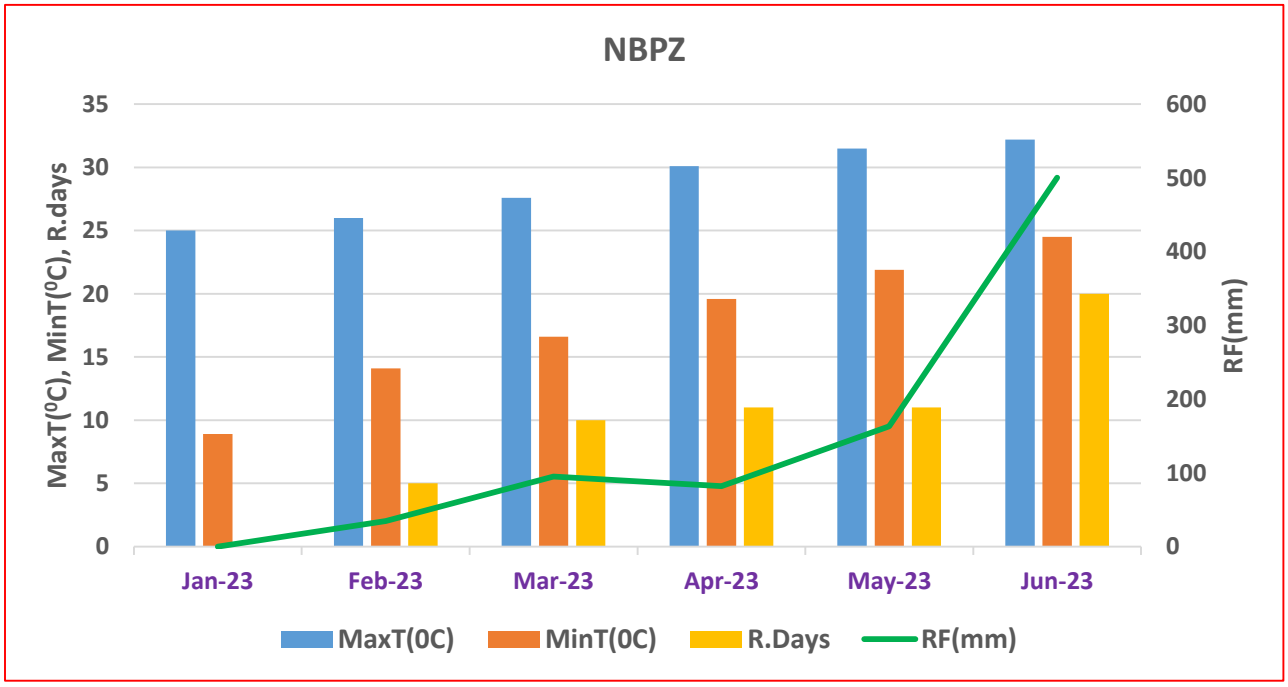


Fig 5: Maximum & Minimum Temperature and Rain fall in NBPZ

Almost all zones received heavy rainfall in the months of June. The average minimum and maximum temperature in all zones were about 19 ºC and 29 ºC respectively. Lower Brahmaputra Valley Zone (LBVZ) received maximum rainfall 1235.4 mm in the month of June. Rain along with hailstorms reported at some places may damage acres of rapeseed-mustard crop in the state.

Chapter 2:
Technical Report

2. PROGRESS OF THE PERIOD FEBRUARY- JULY 2023

2.1 Crop demonstrations: Crop demonstration is the method of motivating farmers for adoption of new varieties and techniques by showing their distinctly superior result. Crop demonstration shows the advantages and applicability of a newly recommended practice in farmer's own situation. Demonstrations are conducted on the farm of selected farmers and are utilized to educate and motivate groups of people in their neighborhood. This is very effective method for the transfer of technology and build up confidence in the farmers and extension agents. Demonstrations may stimulate farmers to try out innovations themselves or may even replace a test of the innovation by the farmers. They can show the causes of problems and their possible solutions without complicated technical details. Under the project, it was planned to organize mustard crop demonstrations on small plots of 0.25 ha area along with 0.05 ha. of control plot to provide practical learning situation and show the production potential of newly released varieties and crop management and protection practices of rapeseed-mustard to farmers, extension personnel and all other stakeholders at farmers' field.

The selection of the sites for conducting demonstrations was done by ATMA personnel of respective districts in consultation with concerned stakeholders and Research Associates/SRF of the project keeping in view of that it should be easily accessable to farmers of neighboring villages and extension workers coming from different parts of the district. Identification of beneficiaries for demonstration was carried out by the Implementing agency with the help of FPC/FPOs working in the district as per the requirement/aptitude of the farmers to conduct the demonstrations. Preference for demonstration was given to the socio-economically backward / small/ marginal / ST / SC / OBC farmers. The selected demonstrating farmers are progressive one with lead and who is easily approachable by other farmers & extension workers. During 2022-23, 5000 mustard crop demonstrations were approved. Accordingly a total of 5000 mustard crop demonstrations in different clusters of 15 districts were laid out (Table 2). Along with mustard crop demonstrations, 18000 minikit demonstrations in the selected clusters to strengthen mustard value chain- production were also laid out. In each minikit, one Kg seed was provided to each farmer to compare it with other existing varieties.The minikit demonstrations are accelerating informal dissemination of scientific cultivation of mustard from farmer to farmer through the introduction, exposure, experience, for acceptance of new varieties. These minikits would help farmers and other stakeholders to grow, observe and experience the performance of the introduced variety and develop learning for self and the associated community. This intends to create awareness in the region and thereby producing demand and a market for the variety for the future. This will also make seeds available in the next season.

Table 2: Progress of crop demonstrations and minikits during crop season 2022-23.

SN	Activities	Target	Achieved
1.	Climate resilient production demonstrations	5000	5000
2	Minikit demonstrations	18000	18000

Based on the climatic situation, cultivation of rapeseed-mustard, prevailing cropping pattern and resources, these demonstrations were conducted with three improved varieties of Indian mustard viz. NRCHB-101 (547), PM-28 (1385) and DRMR-150-35 (1081) and one variety of toria, viz. TS-38

(1987) along with crop management and protection technologies like line sowing, proper seed rate, seed treatment, proper plant population, thinning, weeding, intercultural operations, management of pest and diseases, etc. against the control plot. The seed of these improved varieties were supplied by ICAR-DRMR to DAOs / PD ATMA of 15 selected APART mustard districts. The seed was made available to them timely. The seed of demonstrated variety along with required fertilizers and need based fungicides/pesticides were given to selected farmers for crop demonstration. Under minikit demonstrations, only one kg seed of improved varieties viz. DRMR-150-35 (8070) and PM-28 (6930) of Indain mustard and one variety of toria, viz. TS-38 (3000) were supplied to the farmers. The details of components of demonstrated technology against the control plot or farmers practice is given in Table 3 and district wise details of varieties in mustard crop demonstrations and minikit demonstrations are given in Table 4.

Table 3: Components of demonstrated technology against the control plot

Components of demonstrated technology	**Prevailing farmers practices against demonstrated technology**
Improved varieties (NRCHB-101/PM-28/DRMR-150-35/TS-38)	Local varieties used by farmers
Proper seed rate	Higher seed rate
Balanced use of fertilizers	Imbalance use of fertilizers
Line sowing	Broadcasting
Proper spacing	No proper spacing
Thinning/Weeding	No thinning/Weeding
Proper plant protection measures	Generally not used plant protection measures

Table 4: Distribution of varieties in mustard crop demonstrations and minikit demonstrations.

SN	District (No. of clusters)	Total crop demo (CP)	Total minikit	Varietal distribution of crop and minikit demonstrations						
				NRCH B-101	DRMR-150-35		PM-28		TS-38	
				No. of Demo	No. of Demo		No. of Demo		No. of Demo	
					CP	Minikit	CP	Minikit	CP	Minikit
1.	Barpeta (10)	400	1200	0	116	500	143	500	120	200
2.	Bongaigaon (3)	300	1200	50	50	500	74	500	117	200
3.	Darrang (3)	300	1000	50	80	350	70	450	100	200
4.	Dhemaji (3)	400	1200	50	100	500	70	500	180	200
5.	Dhubri (5)	400	1800	78	78	800	117	800	113	200
6.	Golaghat (4)	200	800	0	30	300	50	300	120	200
7.	Jorhat (4)	300	1000	50	50	400	100	400	100	200
8.	Kamrup (5)	400	1200	0	79	700	100	300	218	200
9.	Kokrajhar (3)	300	1200	47	50	500	69	500	120	200
10.	Morigaon (3)	200	1000	0	50	350	50	450	100	200
11.	Lakhimpur (7)	500	1400	50	110	600	155	600	185	200
12.	Nagaon (5)	400	1800	65	96	1000	91	600	131	200
13.	Nalbari (2)	200	400	0	40	100	57	100	96	200
14.	Sivsagar (3)	200	800	0	45	300	49	300	99	200
15.	Sonitpur (7)	500	2000	97	78	1170	139	630	168	200
	Total	5000	18000	537	1052	8070	1334	6930	1967	3000

The high temperature in the month of November and late harvesting of Sali rice caused delay in sowing of the crops at some places. Keeping in view of temperature, rainfall and land preparation in different clusters, the sowing was completed by 2nd half of December 2022.

The broadcasting method of sowing of mustard was prevailing in the Assam. The line sowing of mustard has several advantages, therefore, effort was done to adopt the line sowing method for conducting mustard crop demonstrations. Line sowing was adopted by many farmers with the efforts of ICAR-DRMR. However, majority of farmers adopted broadcasting method due to non-availability of proper seed drill in their locality.

Regular visits and monitoring of the crop demonstrations and minikit demonstrations are being done by Research Associates, ATMA personnel to educate and motivate the farmers to adopt crop management practices like thinning, intercultural operations, weeding, applying irrigation, management of insects and diseases, etc. The monitoring and supervision of crop demonstrations and activities are also being done by Resident Consultant and experts of ICAR-DRMR.

Cluster wise information for crop demonstration: A total of 5000 demonstrations were laid out in 896 villages of 67 clusters in 15 selected districts, identified by APART for mustard cultivation.

There were 3903 male and 1097 female beneficiaries for crop demonstrations. These crop demonstrations were distributed for different social categories as 1984 (Gen), 1311 (OBC), 517 (SC) and 1188 (ST) beneficiaries. Out of 5000 demonstrations conducted, 4890 crop demonstrations were successful, whereas a total of 110 crop demonstrations (51 of PM-28, 29 of DRMR-150-35, 20 of TS-38 and 10 of NRCHB-101) were failed in different districts due to poor germination, cattle grazing, drought, hail storms, etc. All 4890 successful crop demonstrations were conducted in different situations viz. Irrigated (538) and rainfed (4352) situations during 2022-23.These demonstrations were harvested successfully in Feb.-March 2023 and yield data were analyzed to study the performance of demonstrated technologies.

In successful demonstrations, three varieties namely PM-28 (1334), DRMR-150-35 (1052) and NRCHB-101 (537) of Indian mustard and TS-38 (1967) of toria were used in crop demonstration in different districts. Therefore, the yield analysis of 4890 successful demonstrations on toria and 2927 susscssful demonstrations on Indian mustard has been presented in the report (Table 5).

Table 5: The cluster wise details of beneficiaries and varieties in successful mustard crop demonstrations during 2022-23

District	Cluster	No.of villages	Beneficiaries (No.)						Total no. of Demons	No. of successful crop demonstrations on varieties				No. of CD vitiated
			Gender		Social Category					NRCHB-101	DRMR-150-35	PM-28	TS-38	
			M	F	Gen	OBC	SC	ST						
Barpeta	Bajali	12	34	6	13	21	6	0	40	-	12	14	10	3: DRMR-150-35 & 1: PM-28
	Bhawanipur	5	24	6	20	0	0	10	30	-	8	4	15	2: DRMR-150-35 & 1: PM-28
	Barpeta	12	37	23	58	1	1	0	60	-	15	30	15	0
	Chenga	9	34	6	20	0	20	0	40	-	15	15	10	0
	Chakachaka	12	31	9	20	15	0	5	40	-	12	14	10	3: DRMR-150-35 &1: PM-28
	Gumafulbari	9	43	17	60	0	0	0	60	-	15	30	15	0
	Mandia	8	16	4	18	0	2	0	20	-	5	7	7	1: DRMR-150-35
	Pakabethbari	10	29	11	31	0	9	0	40	-	9	8	20	3: DRMR 150 35
	Rupshi	13	24	6	30	0	0	0	30	-	10	9	8	2: DRMR-150-35 & 1: PM-28
	Sarukehetri	8	37	3	32	1	1	6	40	-	15	12	10	3: PM 28
	Total	**98**	**309**	**91**	**302**	**38**	**39**	**21**	**400**	**-**	**116**	**143**	**120**	**21**
Bongaigaon	Manikpur	3	80	20	70	18	3	9	100	20	20	20	40	0
	Patiladoha	3	75	25	62	30	6	2	100	20	20	26	29	5: TS-38
	Bidyapur	2	70	30	84	6	5	5	100	10	10	28	48	4: PM-28
	Total	**08**	**225**	**75**	**216**	**54**	**14**	**16**	**300**	**50**	**50**	**74**	**117**	**9**
Darrang	Bechimari	9	74	25	56	00	40	03	99	17	26	23	33	0
	Pachim Mangaldoi	35	64	37	35	66	00	00	101	16	27	24	34	0
	Sipajhar	32	58	42	12	64	24	00	100	17	27	23	33	0
	Total	**76**	**196**	**104**	**103**	**130**	**64**	**03**	**300**	**50**	**80**	**70**	**100**	**0**
Dhemaji	Machkhowa	30	118	16	0	3	0	131	134	20	50	20	44	0
	MSTD	10	73	60	0	3	5	125	133	15	25	30	63	0
	Sissiborgaon	06	117	16	0	53	7	73	133	15	25	20	73	0
	Total	**46**	**308**	**92**	**0**	**59**	**12**	**329**	**400**	**50**	**100**	**70**	**180**	**0**

Table 5: The cluster wise details of beneficiaries and varieties in successful mustard crop demonstrations during 2022-23

District	Cluster	No.of villages	Beneficiaries (No.)						Total no. of Demons	No. of successful crop demonstrations on varieties				No. of CD vitiated
			Gender		Social Category					NRCHB-101	DRMR-150-35	PM-28	TS-38	
			M	F	Gen	OBC	SC	ST						
Dhubri	Gauripur	6	52	26	73	5	0	0	78	14	14	20	26	1:DRMR-150-35, 1:NRCHB-101 & 1: TS-38
	Rupshi	5	67	7	48	26	0	0	74	16	13	21	22	2:TS-38 & 1: PM-28
	Agomani	4	49	5	46	8	0	0	54	14	14	16	10	2:TS-38 & 2: PM-28
	Chapar-salkocha	5	57	25	80	2	0	0	82	15	19	24	22	1:TS-38
	Mahamaya	6	93	19	112	0	0	0	112	19	18	36	33	1:DRMR-150-35, 1:NRCHB-101 & 1: TS-38
	Total	**26**	**318**	**82**	**359**	**41**	**0**	**0**	**400**	**78**	**78**	**117**	**113**	**14**
Golaghat	Morangi	35	35	0	25	5	0	5	35	0	10	10	15	0
	Sarupathar	35	33	2	20	2	4	9	35	0	15	10	10	0
	Kakodonga	10	8	2	4	1	0	5	10	0	0	0	10	0
	Bokakhat	112	113	7	13	33	1	73	120	0	5	30	85	0
	Total	**192**	**189**	**11**	**62**	**41**	**5**	**92**	**200**	**0**	**30**	**50**	**120**	**0**
Jorhat	Kaliapani	15	79	21	02	69	01	28	100	08	19	28	40	0
	Dhekorgorah	17	30	0	0	01	09	20	30	05	05	10	0	0
	Majuli	11	65	15	23	40	10	07	80	08	09	30	30	0
	Ujani Majuli	10	62	28	06	25	59	0	90	25	15	30	20	0
	Total	**53**	**236**	**64**	**31**	**135**	**79**	**55**	**300**	**50**	**50**	**100**	**100**	**0**
Kamrup	Sualkuchi	6	77	3	39	0	35	6	**80**	0	30	20	30	0
	Hajo	4	60	10	49	0	20	1	**70**	0	10	20	40	0
	Kamalpur	2	55	5	46	0	13	1	**60**	0	0	20	40	0
	Bihdiya jajikona	8	162	8	107	0	47	16	**170**	0	39	40	88	2:TS-38 & 1:DRMR-150-35
	Chandrapur	1	18	2	10	0	10	-	**20**	0	0	0	20	0
	Total	**21**	**356**	**44**	**251**	**0**	**125**	**24**	**400**	0	**79**	**100**	**218**	**3**

Table 5: The cluster wise details of beneficiaries and varieties in successful mustard crop demonstrations during 2022-23

District	Cluster	No.of villages	Beneficiaries (No.)						Total no. of Demons	No. of successful crop demonstrations on varieties				No. of CD vitiated
			Gender		Social Category					NRCHB-101	DRMR-150-35	PM-28	TS-38	
			M	F	Gen	OBC	SC	ST						
Kokrajhar	Kachugaon	17	117	13	0	7	0	123	130	23	24	28	52	3: NRCHB-101
	Dotma	18	84	1	6	0	0	79	85	16	10	27	32	0
	Kokrajhar	20	82	3	43	12	0	30	85	8	16	14	36	11: PM-28
	Total	**55**	**283**	**17**	**49**	**19**	**0**	**232**	**300**	**47**	**50**	**69**	**120**	**14**
Lakhimpur	Dhakuakhana	25	76	24	5	79	6	10	100	10	30	30	30	0
	Ghilamara	33	30	70	64	0	0	36	100	10	30	30	30	0
	Narayanpur	3	80	0	14	66	0	0	80	10	20	20	30	0
	Bihpuria	3	39	11	0	10	0	40	50	0	5	15	30	0
	Telahi	7	39	21	0	0	0	60	60	5	5	20	30	0
	Karunabari	4	34	16	43	0	0	7	50	10	15	20	5	0
	Lakhimpur	2	48	12	0	60	0	0	60	5	5	20	30	0
	Total	**77**	**346**	**154**	**126**	**215**	**6**	**153**	**500**	**50**	**110**	**155**	**185**	**0**
Morigaon	Bhurbandha	7	88	12	37	38	17	8	100	0	40	30	30	0
	Mayong	7	70	10	10	51	14	5	80	0	0	15	65	0
	Kapili	1	14	6	2	0	-	18	20	0	10	5	5	0
	Total	**15**	**172**	**28**	**49**	**89**	**31**	**31**	**200**	**0**	**50**	**50**	**100**	**0**
Nagaon	Raha	12	78	32	10	54	20	26	110	20	30	26	30	4: PM-28
	Kaliabor	16	64	36	55	30	15	0	100	20	18	26	30	2: DRMR-150-35 4: PM-28
	Batadrava	04	44	16	60	0	0	0	60	5	9	9	31	2:NRCHB-101, 2:PM-28 & 2:DRMR-150-35
	Khagarijan	08	52	18	42	16	12	0	70	10	20	20	20	0
	Pachim Kaliabor	12	50	10	15	27	13	05	60	10	19	10	20	1:DRMR-150-35
	Total	**52**	**288**	**112**	**182**	**127**	**60**	**31**	**400**	**65**	**96**	**91**	**131**	**17**

Table 5: The cluster wise details of beneficiaries and varieties in successful mustard crop demonstrations during 2022-23

District	Cluster	No.of villages	Beneficiaries (No.)						Total no. of Demons	No. of successful crop demonstrations on varieties				No. of CD vitiated
			Gender		Social Category					NRCHB-101	DRMR-150-35	PM-28	TS-38	
			M	F	Gen	OBC	SC	ST						
Nalbari	Borigog Banbhag	10	85	35	62	31	05	22	120	0	20	37	60	3: PM-28
	Barkhetri	14	57	23	70	01	0	09	80	0	20	20	36	4: TS-38
	Total	**24**	**142**	**58**	**132**	**32**	**05**	**31**	**200**	**0**	**40**	**57**	**96**	**07**
Sivsagar	**Demow**	13	80	20	8	29	0	63	100	0	8	40	52	**0**
	Gaurisagar	20	44	16	7	48	1	4	60	0	14	9	35	1: PM-28 & 1: DRMR-150-35
	Sivasagar	4	30	10	35	5	0	0	40	0	23	0	12	1: TS-38 & 4: DRMR-150-35
	Total	**37**	**154**	**46**	**50**	**82**	**1**	**67**	**200**	**0**	**45**	**49**	**99**	**7**
Sonitpur	Bihaguri	23	31	45	03	35	21	17	76	16	08	25	26	1: TS-38
	Dhekiajuli	20	51	21	10	36	16	10	72	14	11	21	24	2: DRMR-150-35
	Gabhoru	17	57	13	26	44	00	00	70	14	12	20	24	00
	Balipara	14	58	12	07	47	03	13	70	13	12	17	23	4: PM-28
	Rangapara	11	65	05	06	37	00	27	70	13	11	18	24	4: PM-28
	Chaiduar	21	61	11	04	32	00	36	72	14	12	20	23	4:PM-28
	Biswanath	10	58	12	16	18	36	00	70	13	12	18	24	3: NRCHB-101
	Total	**116**	**381**	**119**	**72**	**249**	**76**	**103**	**500**	**97**	**78**	**139**	**168**	**18**
	Grand total	**896**	**3903**	**1097**	**1984**	**1311**	**517**	**1188**	**5000**	**540**	**1040**	**1346**	**1964**	**110**

2.1.1 Distribution of crop demonstrations conducted in different situation during 2022-23

The Crop demonstrations included whole package technology components like use of improved variety, balanced use of fertilizers, micronutrients, proper spacing, weeding/thinning, need based plant protection and other cultural practices in comparison to farmers' practices of crop cultivation.

All 4890 successfull crop demonstrations were conducted in different situations viz. Irrigated (538) and rainfed (4352) situations during 2022-23. District wise details of successful and failed crop demonstrations under irrigated and rainfed condition is presented in Table 6.

Table 6: List of successful crop demonstrations during 2022-23 under different situations

District (Number of clusters)	Number of crop demonstrations				
	Total conducted	Irrigated	Rainfed	Demons. successful	Demons. Failed/vitiated
Barpeta (10)	400	49	330	379	21
Bongaigaon (3)	300	30	261	291	09
Darrang (3)	300	36	264	300	00
Dhemaji (3)	400	00	400	400	00
Dhubri (5)	400	107	279	386	14
Golaghat (4)	200	00	200	200	00
Jorhat (3)	300	00	300	300	00
Kamrup (5)	400	121	276	397	03
Kokrajhar (3)	300	37	249	286	14
Lakhimpur (7)	500	00	500	500	00
Morigaon (3)	200	00	200	200	00
Nagaon (5)	400	106	277	383	17
Nalbari (2)	200	52	141	193	07
Sivsagar (3)	200	00	193	193	07
Sonitpur (7)	500	00	482	482	18
	5000	**538**	**4352**	**4890**	**110**

2.1.2. Performance of technology package crop demonstrations in different districts of Assam during 2022-23.

The performance of crop demonstrations conducted in different districts were analysed and presented in Table 7. The results included the mean seed yield (kg/ha) for both, the improved plot (IP) with improved technology and the farmers' plot (FP) with farmers' practice, Besides yield superiority of improved technology (%), cost of cultivation (CoC), gross monetary return (GMR) and additional net monetary return (ANMR) in Rs/ha from the IP and benefit: cost (B:C) ratio for both the IP and FP. These were calculated as follows:

1. $\text{YIOFP}\ (\%) = \dfrac{\text{Yield of IP} - \text{Yield of FP}}{\text{Yield of FP}}\ \text{x}\ 100$
2. $\text{ANMR} = [\text{GMR (IP)} - \text{GMR(FP)}] - [\text{CoC (IP)} - \text{CoC (FP)}]$
3. $\text{B: C ratio} = \dfrac{\text{GMR}}{\text{CoC}}$
4. $\text{GMR} = \text{Seed Yield x Market price of produce}$

The overall performance of of crop demonstrations along with YIOFP (%), cost of cultivation, gross monetary return, additional net monetary return and B:C ratio across the districts in both situation viz. irrigated and rainfed condition presented in Table 7, 8 and 9 shows that mean seed yield from IP ranged from 869 (Sivsagar) to 1235 kg/ha (Dhubri), whereas from FP ranged from 544 (Sivsagar) to 755 kg/ha (Sonitpur). The yield increase due to IP ranged from 41.4 % in Lakhimpur to 84.6% (Dhubri) (Fig. 6). The cost of cultivation of IP ranged from Rs. 22853 (Barpeta) to Rs 30397/ha (Sivsagar), while for FP it ranged from Rs. 19358 (Barpeta)) to Rs. 23752 /ha (Jorhat). The maximum additional cost Rs. 7649/ha for IP incurred (Sonitpur), while minimum Rs. 2173/ha (Kamrup). The maximum ANMR of Rs 25553 /ha was reported due to the improved practices in Barpeta, while minimum of Rs 8381 /ha was in Kokrajhar. All IP had positive ANMR (Table 7). The Gross Monetary Return for IP ranged from Rs. 47361/ ha in Sivasagar to Rs. 67308/ha in Dhubri, while in FP ranged from Rs. 29648/ha in Sivasagar to Rs 41093/ ha in Sonitpur (Table 7). The B:C ration for IP ranged from 1.55 (Sivsagar) to 2.86 (Barpeta), while for FP it ranged from 1.28 (Sivsagar) to 1.91 (Bongaigaon) (Table 7). The higher gross monetary return (GMR) and B:C ratio of demonstrated technology and positive additional net monetary return (ANMR) in all districts evidently show that demonstrated technology of rapeseed-mustard during 2022-23 was economically viable and profitable for the farmers of Assam.

The performance of of crop demonstrations in irrigated and rainfed situation across the districts presented in Table 8 and 9 along with Fig. 7 and 8, respectively.

Table 7: Overall district wise performance of crop demonstration in both situation viz. Irrigated and rainfed during 20222-23

District	Verities used	FLDs	Mean Seed Yield (Kg/ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B:C Ratio	
			IP	FP		IP	FP	IP	FP		IP	FP
Barpeta	DRMR-150- 35, PM-28 TS-38	379	1200 (705-1725)	667 (433-960)	79.91	22853	19358	65400	36352	25553	2.86	1.87
Bongaigaon	DRMR-150-35, PM-28, NRCHB-101, TS-38	291	1026 (432-1438)	685 (372-894)	49.78	23593	19523	55917	37333	14514	2.37	1.91
Darrang	DRMR-150-35, PM-28 NRCHB-101, TS-38	300	955 (650-1875)	622 (451-989)	53.53	24946	21615	52048	33899	14818	2.08	1.56
Dhemaji	DRMR-150-35, PM-28 NRCHB-101, TS-38	400	1037 (689-1305)	697 (472-960)	48.78	24863	21238	56517	37987	14905	2.27	1.78
Dhubri	DRMR-150-35, PM-28 NRCHB-101, TS-38	386	1235 (705-1896)	669 (421-1102)	84.60	28797	21148	67308	36461	23198	2.33	1.72
Golaghat	DRMR-150-35 PM-28, TS-38	200	1051 (450-1490)	693 (330-900)	51.65	26048	22082	57280	37769	15545	2.19	1.71
Jorhat	DRMR-150-35, PM-28 NRCHB-101, TS-38	300	1077 (333-1500)	666 (400-900)	61.71	27573	23752	58697	36297	18579	2.12	1.52
Kamrup	DRMR-150-35, PM-28 TS-38	397	990 (713-1785)	669 (514-950)	47.98	24962	22789	53955	36461	15321	2.16	1.59
Kokrajhar	DRMR-150-35, PM-28 NRCHB-101, TS-38	286	949 (705-1200)	685 (530-890)	38.54	27044	21037	51721	37333	8381	1.91	1.77
Lakhimpur	DRMR-150-35, PM-28 NRCHB-101, TS-38	500	1024 (380-1894)	724 (320-1245)	41.43	23785	20615	55808	39458	13180	2.34	1.91
Morigaon	DRMR-150-35, PM-28, TS-38	200	936 (497-1500)	612 (307-990)	52.94	24031	21178	51012	33354	14805	2.12	1.57
Nagaon	DRMR-150-35, PM-28 NRCHB-101, TS-38	383	983 (365-1830)	694 (305-1075)	41.64	23773	20633	53574	37823	12611	2.25	1.83
Nalbari	DRMR-150-35, PM-28, TS-38	193	946 (570-1580)	614 (320-875)	54.07	27055	21952	51557	33463	12991	1.90	1.52
Sivsagar	DRMR-150-35, PM-28, TS-38	193	869 (570-1166)	544 (349-694)	59.74	30397	23152	47361	29648	10468	1.55	1.28
Sonitpur	DRMR-150-35, PM-28 NRCHB-101, TS-38	482	1082 (890-1290)	754 (670-870)	43.50	28226	21636	58969	41093	11286	2.08	1.90

Table 8: Overall district-wise performance of crop demonstrations in irrigated situation during 2022-23

Districts	Crops	FLDs	Mean Seed Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio	
			IP	FP		IP	FP	IP	FP		IP	FP
Barpeta	DRMR-150-35, PM-28 TS38	49	1402 (1133-1725)	746 (592-960)	87.93	27233	22106	76409	40657	30619	2.80	1.83
Bongaigaon	DRMR 150-35, PM-28 NRCHB-101, TS-38	**30**	1120 (840-1438)	719 (580-855)	55.77	24700	20381	61040	39186	17535	2.47	1.92
Darrang	PM-28, TS-38	36	1199 (960-1875)	737 (502-989)	62.68	31500	28200	65346	40167	32398	2.60	1.64
Dhubri	DRMR 150-35, PM-28 NRCHB-101, TS-38	107	1389 (1005-1896)	742 (450-994)	87.19	32880	24595	75701	40439	26976	2.30	1.64
Kamrup	DRMR 150-35, PM-28, TS-38	121	1290 (862-1785)	833 (591-1120)	54.86	27608	25065	70305	45399	22363	2.54	1.81
Kokarajgar	DRMR-150-35, PM-28 NRCHB-101,	37	1122 (835-1310)	721 (600-870)	55.61	32061	23127	61149	39295	12920	1.90	1.69
Nagaon	DRMR 150-35, PM-28, NRCHB-101, TS-38	106	1225 (850-1830)	837 (570-1075)	46.40	28474	24789	66763	45617	17461	2.34	1.84
Nalbari	DRMR-150-35, PM-28	52	1117 (615-1580)	658 (395-875)	69.75	28879	22561	60877	35861	18698	2.10	1.58

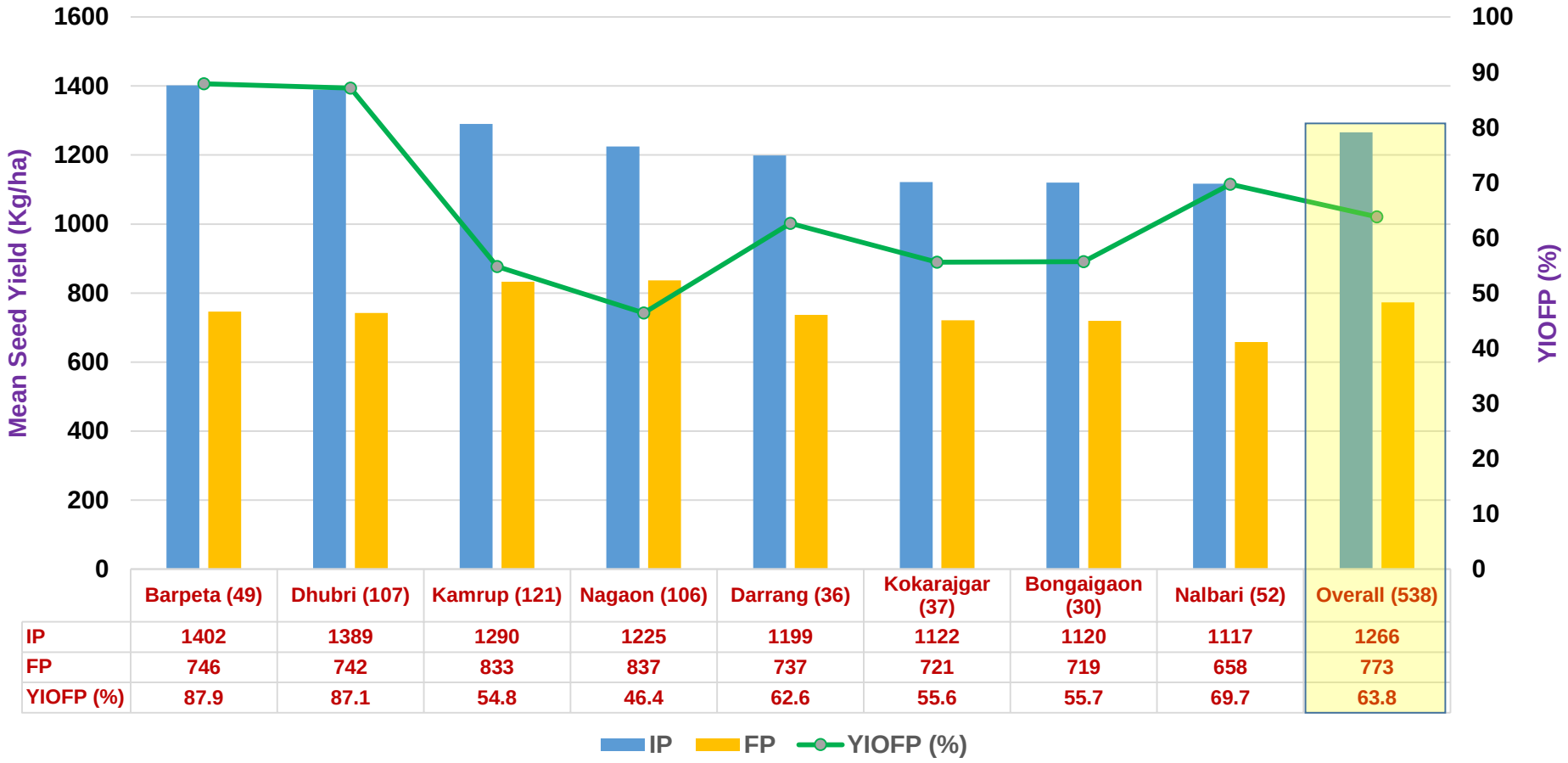
Table 9: Overall district-wise performance of crop demonstrations in rainfed situation during 2022-23

Districts	Crops	FLDs	Mean Seed Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio	
			IP	FP		IP	FP	IP	FP		IP	FP
Barpeta	DRMR-150-35, PM-28, TS-38	330	998 (705-1365)	588 (433-855)	69.72	22203	18950	54391	32046	19092	2.44	1.69
Bongaigaon	DRMR-150-35, PM-28 NRCHB-101, TS-38	261	1015 (432-1350)	681 (372-894)	49.04	23465	19425	55318	37115	14163	2.35	1.91
Darrang	DRMR 150-35, PM-28 NRCHB-101, TS-38	264	922 (650-125)	607 (502-806)	51.89	24358	21243	50249	33082	14052	2.06	1.55
Dhemaji	DRMR-150-35, PM-28 NRCHB-101, TS-38	400	1037 (689-1305)	697 (472-960)	48.78	24863	21238	56517	37987	14905	2.27	1.78
Dhubri	DRMR-150-35, PM-28 NRCHB-101, TS-38	279	1080 (705-1488)	596 (421-1102)	81.20	27231	19827	58860	32482	18969	2.16	1.63
Golaghat	DRMR-150-35 PM-28, TS-38	200	1051 (450-1490)	693 (330-900)	51.65	26048	22082	57280	37769	15545	2.19	1.71
Jorhat	DRMR-150-35, PM-28 NRCHB-101, TS-38	300	1077 (333-1500)	666 (400-900)	61.71	27573	23752	58697	36297	18579	2.12	1.52
Kamrup	DRMR 150-35, PM-28 TS-38	276	963 (713-1400)	679 (514-950)	41.82	23791	21775	52484	37006	13534	2.20	1.69
Kokarajhar	DRMR-150-35, PM-28 NRCHB-101, TS-38	249	924 (705-1200)	679 (530-890)	36.08	26295	20719	50358	37006	7776	1.91	1.78
Lakhimpur	DRMR-150-35, PM-28 NRCHB-101, TS-38	500	1024 (380-1894)	724 (320-1245)	41.43	23785	20615	55808	39458	13180	2.34	1.91
Morigaon	DRMR-150-35 PM-28,TS-38	100	886 (497-1500)	575 (307-990)	54.08	23669	21027	48287	31338	14307	2.04	1.49
Nagaon	DRMR 150-35, PM-28 NRCHB-101, TS-38	277	891 (365-1272)	640 (305-925)	39.21	21974	19042	48560	34880	10748	2.20	1.83
Nalbari	DRMR-150-35 PM-28, TS-38	141	883 (570-1420)	597 (320-820)	47.90	26382	21916	48124	32537	11121	1.82	1.48
Sivasagar	DRMR-150-35 PM-28 TS-38	193	869 (570-1166)	544 (349-694)	59.74	30397	23152	47361	29648	10468	1.55	1.28
Sonitpur	DRMR-150-35, PM-28 NRCHB-101 TS-38	482	1082 (890-1290)	754 (670-870)	43.50	28226	21636	58969	41093	11286	2.08	1.90

Fig. 6 : Overall average performance of IP demonstrations against the FP demonstrations in different districts in both situations viz. irrigated and rainfed

	Dhubri (386)	Barpeta (379)	Sonitpur (482)	Jorhat (300)	Golaghat (200)	Dhemaji (400)	Bongaigaon (291)	Lakhimpur (500)	Kamrup (397)	Nagaon (383)	Darrang (300)	Kokrajhar (286)	Nalbari (193)	Morigaon (200)	Sivsagar (193)	Overall (4890)
IP	1235	1200	1085	1077	1051	1037	1026	1024	990	983	955	949	946	936	869	1026
FP	669	667	755	666	693	697	685	724	669	694	622	685	614	612	544	680
YIOFP (%)	84.6	79.9	43.7	61.7	51.6	48.7	49.8	41.4	47.9	41.6	53.5	38.5	54	52.9	59.7	50.9

Fig. 7: Overall average performance of IP demonstrations against the FP demonstrations in different districts in irrigated situation



	Barpeta (49)	Dhubri (107)	Kamrup (121)	Nagaon (106)	Darrang (36)	Kokarajgar (37)	Bongaigaon (30)	Nalbari (52)	Overall (538)
IP	1402	1389	1290	1225	1199	1122	1120	1117	1266
FP	746	742	833	837	737	721	719	658	773
YIOFP (%)	87.9	87.1	54.8	46.4	62.6	55.6	55.7	69.7	63.8

Fig. 8: Overall average performance of IP demonstrations against the FP demonstrations in different districts in rainfed situation

	Sonitpur (482)	Dhubri (279)	Jorhat (300)	Golaghat (200)	Dhemaji (400)	Lakhimpur (500)	Bongaigaon (261)	Barpeta (330)	Kamrup (276)	Morigaon (200)	Kokarajhar (249)	Darrang (264)	Nagaon (277)	Nalbari (141)	Sivasagar (193)	Overall (4352)
IP	1082	1080	1077	1051	1037	1024	1015	998	963	936	924	922	891	883	869	996
FP	754	596	666	693	697	724	681	588	679	612	679	607	640	597	544	668
YIOFP (%)	43.5	81.2	61.7	51.6	48.7	41.4	49	69.7	41.8	52.9	36	51.8	39.2	47.9	59.7	49.1

2.1.3. Performance of crop demonstrations in Barpeta district of Assam during 2022-23

In Barpeta, 400 crop demonstrations (CD) were conducted in 98 villages of ten clusters viz. Bajali (40 CD), Bhawanipur (30 CD), Barpeta (60 CD), Chenga (40 CD), Chakachaka (40 CD), Gumafulbari (60 CD), Mandia (20 CD), Pakabethbari (40 CD), Rupshi (30 CD), Sarukehetri (40 CD) with PM-28 (150 CD), DRMR-150-35 (130 CD) varieties of Indian mustard and TS-38 (120 CD) variety of toria under both irrigated (31 CD) and rainfed (89 CD) conditions. Out of 400 crop demonstrations, 21 crop demonstrations (14 of DRMR-150-35 and 7 of PM-28) had failed because of poor germination due to lack of moisture, poor management by farmers, delayed sowing.(Table 5 and 6).

The prevailing cropping pattern was rice-mustard, jute-mustard, fellow-mustard and rice-vegetables (potato/pumpkin). The sowing time spread from Nov. 10 to Dec. 25, 2022 and harvesting period spread from Feb. 20 to March 30, 2023. Some incidence of painted bug, mustard sawfly, mustard aphid, white rust, Alterneria bight and phyllody (especially in PM-28 variety) was observed.

The demonstrated improved technologies (IP) in 379 successful crop demonstrations gave an average seed yield of 1200 kg/ha against 667 kg/ha in FP with a yield improvement of 79.9% (Table 7). The cost of cultivation of Rs. 22853/ha in IP against the Rs. 19358/ha in FP was recorded that fetched GMR of Rs. 65400 /ha in IP against the Rs. 36352/ha in FP. An ANMR of Rs. 25553 /ha was realized against the additional cost of Rs. 3495/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.86) than that of FP (1.87) clearly indicates that demonstrated technologies in Barpeta district was economically viable and profitable.

Under irrigated condition, the overall performance of demonstrated technologies in 49 successful crop demonstrations with three varieties (DRMR-150-35, PM-28 and TS-38) recorded an average seed yield of 1402 kg/ha against 746 kg/ha in FP with a yield improvement of 87.9% (Table 8). The cost of cultivation of Rs. 27233/ha in IP against the Rs. 22106/ha in FP was recorded that fetched GMR of Rs. 76409 /ha in IP against the Rs. 40657/ha in FP. An ANMR of Rs. 30619 /ha was realized against the additional cost of Rs. 5127/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.80) than that of FP (1.83).

The variety-wise analysis under irrigated condition (Fig. 9) shows that IP demonstrations with PM-28 (09 CD) recorded highest average seed yield of 1540 kg/ha against 783 kg/ha in FP with a yield improvement of 96.7% against the additional cost of cultivation of Rs. 5880/ha, while demonstrations with DRMR 150-35 (9 CD) had an average seed yield of 1488 kg/ha against 753 kg/ha in FP with highest yield improvement of 97.60%. The IP demonstrations with TS-38 (31 CD) had an average seed yield of 1289 kg/ha against 723 kg/ha in FP with a yield improvement of 78.3%. The maximum ANMR (Rs. 34460 /ha) was reported from DRMR-150-35 variety, while minimum (Rs. 26075 /ha) from TS-38. The cost of cultivation in IP ranged from Rs. 26480 /ha with TS-38 to Rs. 28580/ha with DRMR-150-35, while in FP it ranged from Rs. 21708 /ha with TS-38 to Rs. 22983/ha with DRMR 150-35. All demonstrated varieties had higher B:C ratio than that of FP.

Under rainfed condition, the overall performance of demonstrated technologies in 330 successful crop demonstrations with all three varieties recorded average seed yield of 998 kg/ha against 588 kg/ha in FP with yield improvement of 69.7% (Table 9). The cost of cultivation of Rs. 22203/ha in IP against the Rs. 18950/ha in FP was recorded that fetched GMR of Rs. 54391 /ha in IP against the Rs. 32046/ha in FP. An ANMR of Rs. 19092/ha was realized against the additional cost of Rs. 3235/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.44) than that of FP (1.69).

The variety-wise analysis under rainfed condition (Fig. 10) shows that IP demonstrations with PM-28 (134 CD) recorded highest average seed yield of 1122 kg/ha against 641 kg/ha in FP with a yield improvement of 75.1% against the additional cost of cultivation of Rs. 3219/ha, while demonstrations with DRMR 150-35 (107 CD) recorded an average seed yield of 1113 kg/ha against 623 kg/ha in FP with highest yield improvement of 78.7%. The IP demonstrations with TS-38 (89 CD) had an average seed yield of 878 kg/ha against 544 kg/ha in FP with a yield improvement of 61.4%. The maximum ANMR (Rs. 23248 /ha) from DRMR 150-35 variety, while minimum (Rs. 15145 /ha) from TS-38 was reported. The cost of cultivation in IP ranged from Rs. 20643 /ha with TS-38 to Rs. 22781/ha with DRMR 150-35, while in FP it ranged from Rs. 17585 /ha with TS-38 to Rs. 19558/ha with PM-28. All demonstrated varieties had higher B:C ratio than that of FP.

Fig 9: Performance of different varieties in Barpeta district of Assam in irrigated situation

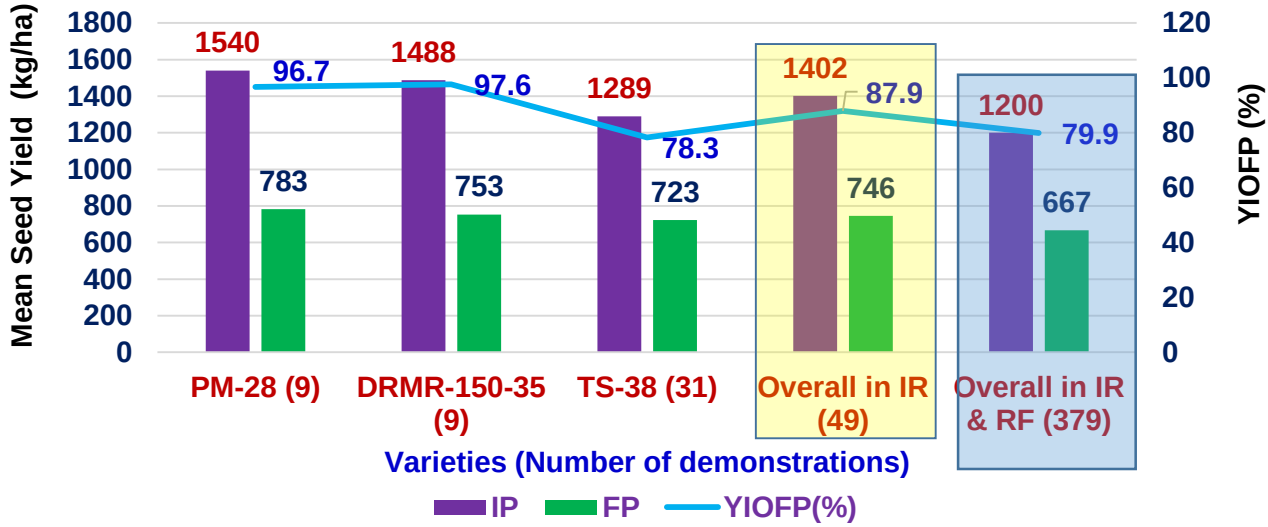
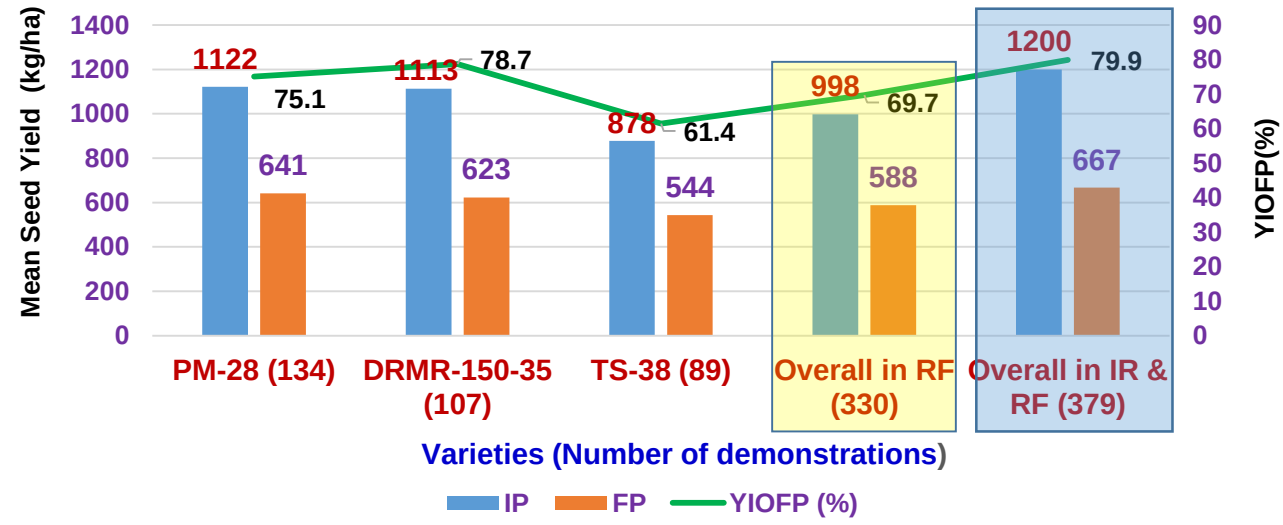


Fig 10: Performance of different varieties in Barpeta district of Assam in rainfed situation



2.1.4. Performance of crop demonstrations in Bongaigaon district of Assam during 2022-23

In Bongaigaon, 300 crop demonstrations (CD) were conducted in 8 villages of three clusters viz. Bidyapur (100 CD), Manikpur (100 CD) and Patiladoha (100) with PM-28 (80 CD), NRCHB-101 (50 CD), DRMR-150-35 (50 CD) varieties of Indian mustard and TS-38 (120 CD) variety of toria under both irrigated (30 CD) and rainfed (261 CD) conditions. (Table 5 and 6).

The prevailing cropping pattern was rice-mustard, jute-mustard, fellow-mustard and rice-vegetables (potato/pumpkin) . The sowing time spread from November 15 to December 10, 2022 and harvesting period spread from Feb. 25 to March 31, 2023. Some incidence of painted bug, mustard sawfly, mustard aphid, white rust, Alterneria bight was observed.

The demonstrated improved technologies (IP) in 291 successful crop demonstrations gave an average seed yield of 1026 kg/ha against 685 kg/ha in FP with a yield improvement of 49.8% (Table 7). The cost of cultivation of Rs. 23593/ha in IP against the Rs. 19523/ha in FP was recorded that fetched GMR of Rs. 55917 /ha in IP against the Rs. 37333/ha in FP. An ANMR of Rs. 14515 /ha was realized against the additional cost of Rs. 4070/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.37) than that of FP (1.91) clearly indicates that demonstrated technologies in Bongaigaon district was economically viable and profitable.

Under irrigated condition, the overall performance of demonstrated technologies in 30 successful crop demonstrations with all four varieties (NRCHB-101, PM-28, DRMR-150-35 and TS-38) recorded an average seed yield of 1120 kg/ha against 719 kg/ha in FP with a yield improvement of 55.8% (Table 8). The cost of cultivation of Rs. 24700/ha in IP against the Rs. 20381/ha in FP was recorded that fetched GMR of Rs. 61040 /ha in IP against the Rs. 39186/ha in FP. An ANMR of Rs. 17535 /ha was realized against the additional cost of Rs. 4319/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.47) than that of FP (1.92).

The variety-wise analysis under irrigated condition (Fig. 11) shows that IP demonstrations with DRMR 150-35 (4 CD) recorded highest average seed yield of 1302 kg/ha against 806 kg/ha in FP with highest yield improvement of 61.5% against the additional cost of cultivation of Rs. 4667/ha, while demonstrations with PM-28 (11 CD) had an average seed yield of 1184 kg/ha against 747 kg/ha in FP with a yield improvement of 58.5%. The IP demonstrations with NRCHB-101(5 CD) had an average seed yield of 1139 kg/ha against 717 kg/ha in FP with a yield improvement of 58.9% and the IP demonstrations with TS-38 (10 CD) had an average seed yield of 968 kg/ha against 654 kg/ha in FP with a yield improvement of 48.0%. The maximum ANMR (Rs. 22365 /ha) was reported from DRMR 150-35 variety, while minimum (Rs. 13171 /ha) from TS-38. The cost of cultivation in IP ranged from Rs. 23259 /ha with TS-38 to Rs. 25751/ha with DRMR 150-35, while in FP it ranged from Rs. 19317 /ha with TS-38 to Rs. 21084/ha with DRMR-150-35. All demonstrated varieties had higher B:C ratio than that of FP.

Under rainfed condition, the overall performance of demonstrated technologies in 261 successful crop demonstrations with all four varieties recorded average seed yield of 1015 kg/ha against 681 kg/ha in FP with yield improvement of 49.0% (Table 9). The cost of cultivation of Rs. 23465/ha in IP against the Rs. 19425/ha in FP was recorded that fetched GMR of Rs. 55318 /ha in IP against the Rs. 37115/ha in FP. An ANMR of Rs. 14163/ha was realized against the additional cost of Rs. 4040/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.35) than that of FP (1.91). The variety-wise analysis under rainfed condition (Fig. 12) shows that IP demonstrations with DRMR-150-35 (46 CD) recorded highest average seed yield of 1095 kg/ha against 721 kg/ha in FP with highest yield improvement of 51.9% against the additional cost of cultivation of Rs. 4502/ha, while demonstrations with PM-28 (63 CD) recorded an average seed yield of 1070 kg/ha against 699 kg/ha

in FP with a yield improvement of 53.1%. The IP demonstrations with NRCHB-101 (45 CD) had an average seed yield of 1065 kg/ha against 689 kg/ha in FP with a yield improvement of 54.6%. The IP demonstrations with TS-38 (107 CD) had an average seed yield of 927 kg/ha against 650 kg/ha in FP with a yield improvement of 42.61%. The maximum ANMR (Rs.16696 /ha) from NRCHB-101 variety, while minimum (Rs. 11253 /ha) from TS-38 was reported. The cost of cultivation in IP ranged from Rs. 22920 /ha with TS-38 to Rs. 24094/ha with DRMR-150-35, while in FP it ranged from Rs. 19076 /ha with TS-38 to Rs. 19925/ha with NRCHB-101. All demonstrated varieties had higher B:C ratio than that of FP.

Fig 11: Performance of different varieties in Bongaigaon district of Assam in irrigated situation

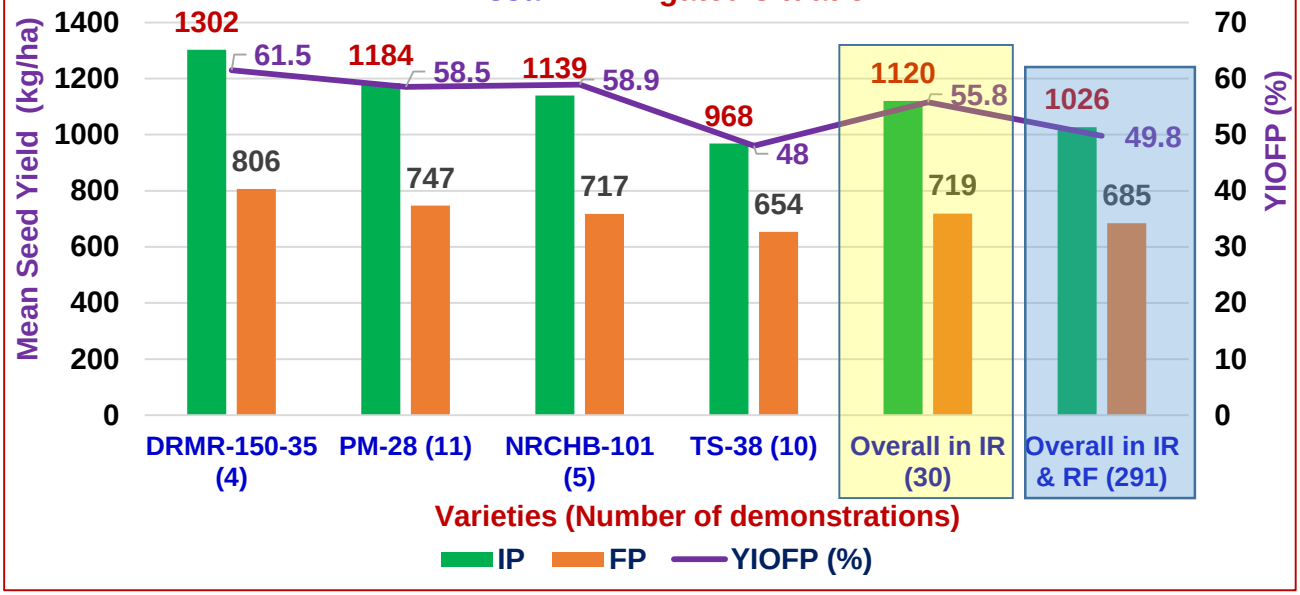
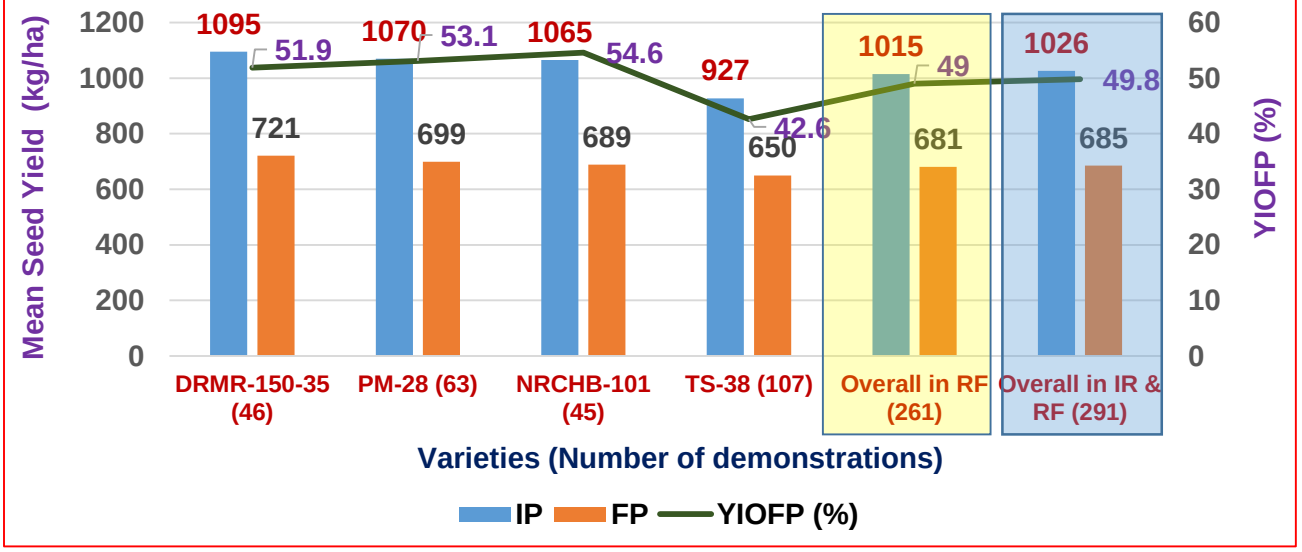


Fig 12: Performance of different varieties in Bongaigaon district of Assam in rainfed situation



2.1.5. Performance of crop demonstrations in Darrang district of Assam during 2022-23

In Darrang, 300 crop demonstrations (CD) were conducted in 76 villages of three clusters viz. Sipajhar (100 CD), Bachimari (99 CD) and Pachim-Mangaldai (101 CD) with NRCHB-101 (50 CD), PM-28 (70 CD), DRMR-150-35 (80 CD) varieties of Indian mustard and TS-38 (100 CD) variety of toria under both irrigated (36 CD) and rainfed (264 CD) conditions (Table 5 and 6).

The prevailing cropping pattern was paddy-mustard-vegetables, paddy-mustard-maize and sali paddy-maize/potato. The sowing time spread from October 27 to November 30, 2022 and harvesting period spread from February 15 to March 20, 2023. There was no severe infestation of pest and diseases. Some incidence of mustard saw fly and Alterneria bight was observed but there was no loss to yield.

The demonstrated improved technologies (IP) in 300 demonstrations gave an average seed yield of 955 kg/ha against 622 kg/ha in FP with a yield improvement of 53.5% (Table 7). The cost of cultivation of Rs. 24946/ha in IP against the Rs. 21615/ha in FP was recorded that fetched GMR of Rs. 52048 /ha in IP against the Rs. 33899/ha in FP. An ANMR of Rs. 14818 /ha was realized against the additional cost of Rs. 3331 /ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.08) than that of FP (1.56) clearly indicates that demonstrated technologies in Darrang district was economically viable and profitable.

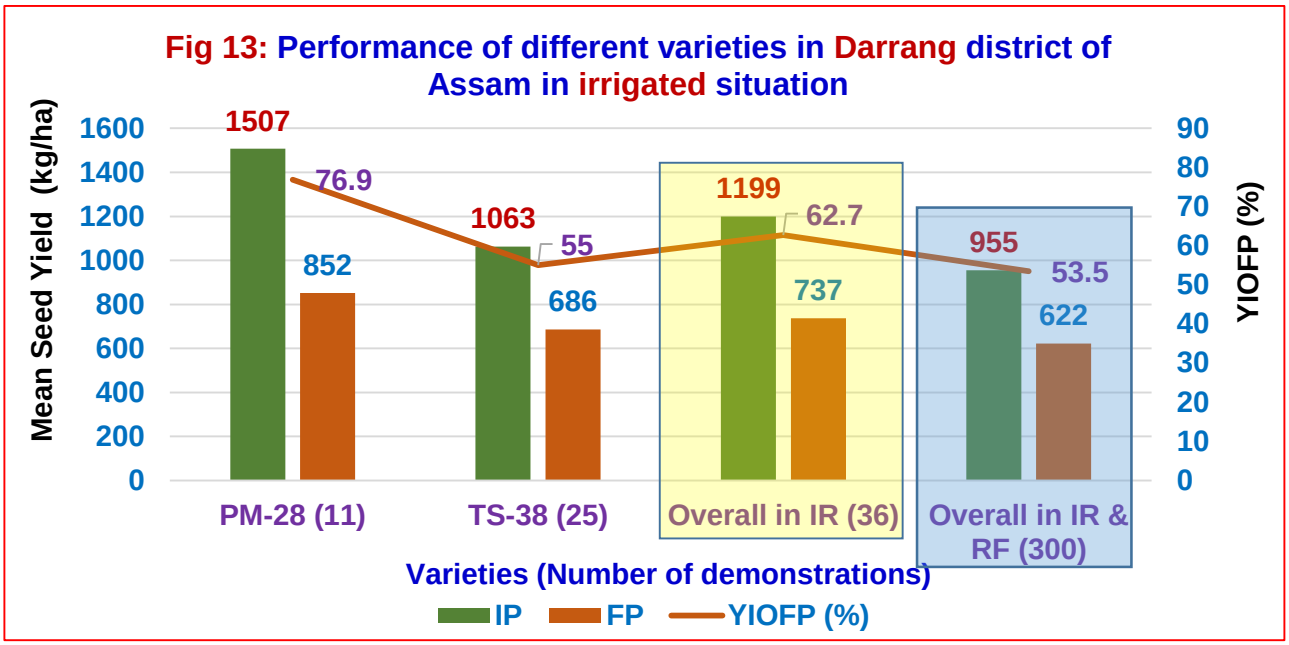
Under irrigated condition, the overall performance of demonstrated technologies in 36 demonstrations with three varieties (PM-28 and TS-38) recorded an average seed yield of 1199 kg/ha against 737 kg/ha in FP with a yield improvement of 62.7% (Table 8). The cost of cultivation of Rs. 29266/ha in IP against the Rs. 24348/ha in FP was recorded that fetched GMR of Rs. 65346/ha in IP against the Rs. 40167/ha in FP. An ANMR of Rs. 19661 /ha was realized against the additional cost of Rs. 4918/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.18) than that of FP (1.64).

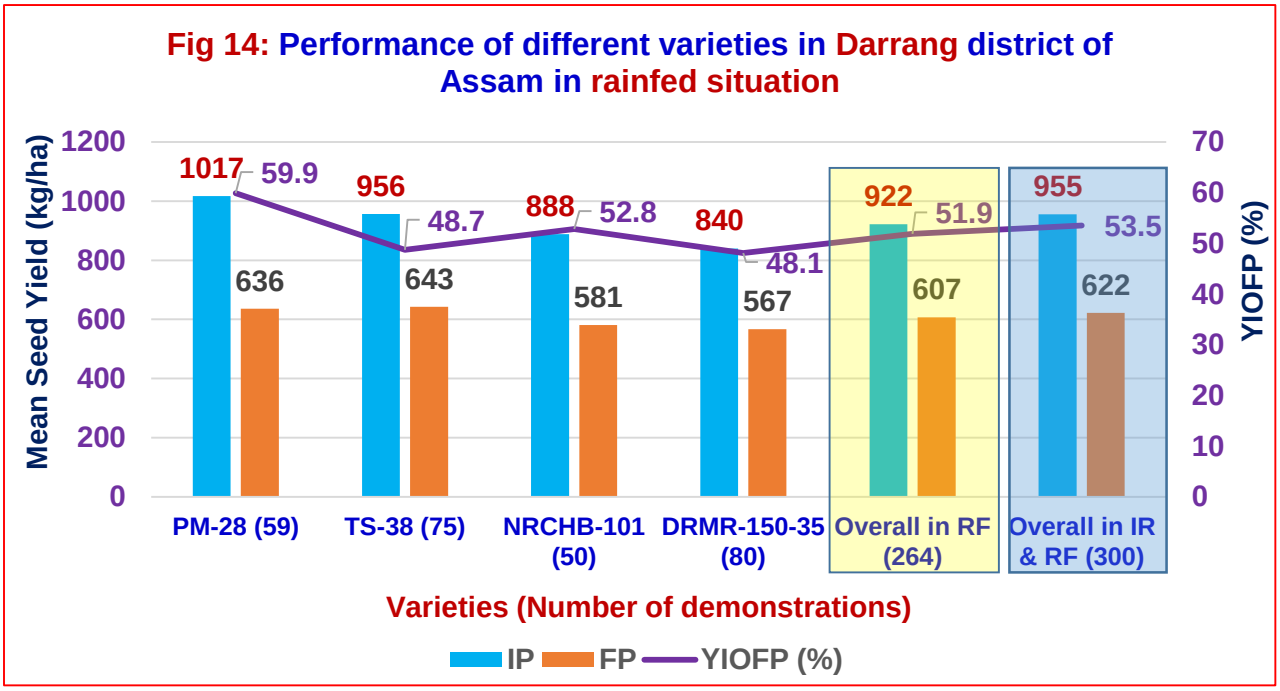
The variety-wise analysis under irrigated condition (Fig. 13) shows that IP demonstrations with PM-28 (11 CD) recorded highest average seed yield of 1507 kg/ha against 852 kg/ha in FP with highest yield improvement of 76.9% against the additional cost of cultivation of Rs. 3300/ha, while the IP demonstrations with TS-38 (25 CD) had an average seed yield of 1063 kg/ha against 686 kg/ha in FP with a yield improvement of 55.0%. The maximum ANMR (Rs. 32398 /ha) was reported from PM-28 variety, while minimum (Rs. 14917 /ha) from TS-38. The cost of cultivation in IP ranged from Rs. 28283 /ha with TS-38 to Rs. 31500/ha with PM-28, while in FP it ranged from Rs. 22653 /ha with TS-38 to Rs. 28200/ha with PM-28. All demonstrated varieties had higher B:C ratio than that of FP.

Under rainfed condition, the overall performance of demonstrated technologies in 264 demonstrations with all four varieties (DRMR-150-35, NRCHB-101, PM-28 and TS-38) recorded an average seed yield of 922 kg/ha against 607 kg/ha in FP with a yield improvement of 51.9% (Table 9). The cost of cultivation of Rs. 24358/ha in IP against the Rs. 21243/ha in FP was recorded that fetched GMR of Rs. 50249 /ha in IP against the Rs. 33082/ha in FP. An ANMR of Rs. 14052 /ha was realized against the additional cost of Rs. 3115/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.06) than that of FP (1.55).

The variety-wise analysis under rainfed condition (Fig. 14) shows that IP demonstrations with PM-28 (59 CD) recorded highest average seed yield of 1017 kg/ha against 636 kg/ha in FP with highest yield improvement of 59.9% against the additional cost of cultivation of Rs. 3218/ha, while demonstrations with TS-38 (75 CD) recorded an average seed yield of 956 kg/ha against 643 kg/ha in FP with a yield improvement of 48.7%. The IP demonstrations with NRCHB-101 (50 CD) had an average seed yield of 888 kg/ha against 581 kg/ha in FP with a yield improvement of 52.8%. The IP

demonstrations with DRMR-150-35 (80 CD) had an average seed yield of 840 kg/ha against 567 kg/ha in FP with a yield improvement of 48.1%. The maximum ANMR (Rs. 17547 /ha) from PM-28 variety, while minimum (Rs. 11953 /ha) from DRMR-150-35 was reported. The cost of cultivation in IP ranged from Rs. 25008 /ha with PM-28 to Rs. 23645/ha with DRMR-150-35, while in FP it ranged from Rs. 20746 /ha with DRMR-150-35 to Rs.21790/ha with PM-28. All demonstrated varieties had higher B:C ratio than that of FP.





2.1.6. Performance of crop demonstrations in Dhemaji district of Assam during 2022-23

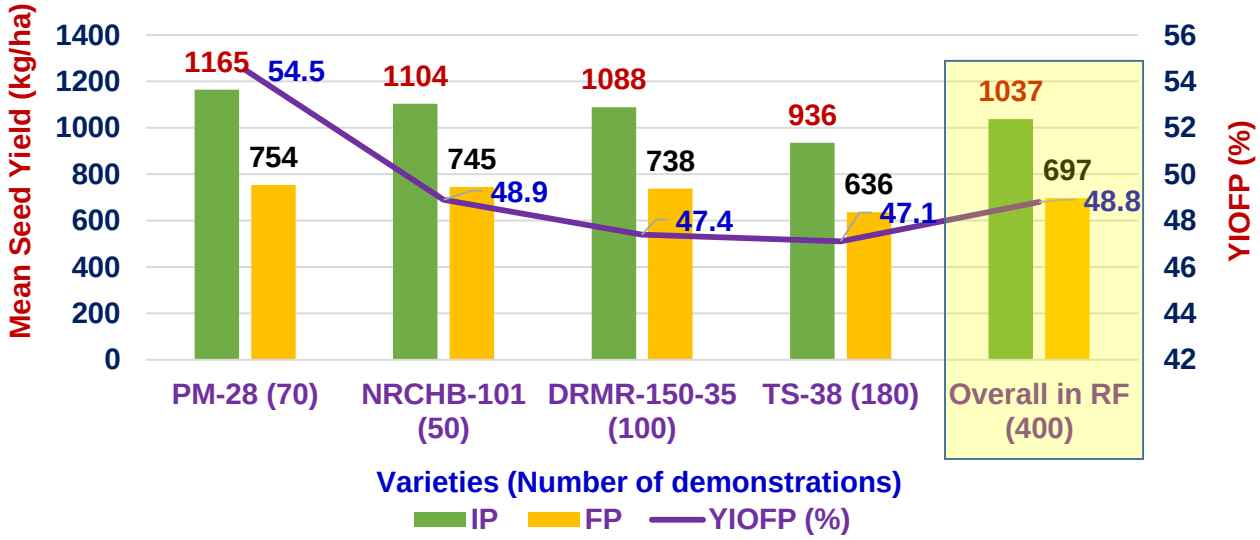
In Dhemaji, 400 crop demonstrations (CD) were conducted in 46 villages of three clusters viz. Machkhowa (134 CD), MSTD (133 CD) and Sissiborgaon (133 CD) with NRCHB-101 (50 CD), PM-28 (70 CD), DRMR-150-35 (100 CD) varieties of Indian mustard and TS-38 (180 CD) variety of toria only under rainfed condition. (Table 5 and 6).

The prevailing cropping pattern was sali paddy-fallow, sali paddy-toria/ rabi vegetables and summer green gram–potato/ toria/ summer rice-rabi vegetables. The sowing time spread from Nov. 7 to Dec. 15, 2022 and harvesting period spread from February 25 to March 25, 2023. There was no severe infestation of pest and diseases. The infestation of mustard sawfly, mustard aphid, Alternaria blight and Sclerotinia Rot were found, however no major damage was observed.

Under rainfed condition, the demonstrated improved technologies (IP) in 400 successful crop demonstrations gave an average seed yield of 1037 kg/ha against 697 kg/ha in FP with a yield improvement of 48.8 % (Table 9). The cost of cultivation of Rs. 24863/ha in IP against the Rs. 21238/ha in FP was recorded that fetched GMR of Rs. 56517 /ha in IP against the Rs. 37987/ha in FP. An ANMR of Rs. 14905/ha was realized against the additional cost of Rs. 3625 /ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.27) than that of FP (1.78) clearly indicates that demonstrated technologies in Dhemaji district was economically viable and profitable.

The variety-wise analysis under rainfed condition (Fig. 15) shows that IP demonstrations with PM-28 (70 CD) recorded highest average seed yield of 1165 kg/ha against 754 kg/ha in FP with highest yield improvement of 54.5 % against the additional cost of cultivation of Rs. 3938/ha, while demonstrations with NRCHB-101 (50 CD) recorded an average seed yield of 1104 kg/ha against 745 kg/ha in FP with a yield improvement of 48.9 %. The IP demonstrations with DRMR-150-35 (100 CD) had an average seed yield of 1088 kg/ha against 738 kg/ha in FP with a yield improvement of 47.4%. The IP demonstrations with TS-38 (180 CD) had an average seed yield of 936 kg/ha against 636 kg/ha in FP with a yield improvement of 47.1 %. The maximum ANMR (Rs. 18462/ha) from PM-28 variety, while minimum (Rs. 13350 /ha) from TS-38 was reported. The cost of cultivation in IP ranged from Rs. 26161/ha with NRCHB-101 to Rs. 23677 /ha with TS-38, while in FP it ranged from Rs. 22371 /ha with NRCHB-101 to Rs. 20243 /ha with TS-38. All demonstrated varieties had higher B:C ratio than that of FP.

Fig 15: Performance of different varieties in Dhemaji district of Assam in rainfed situation



2.1.7. Performance of crop demonstrations in Dhubri district of Assam during 202-23

In Dhubri, 400 crop demonstrations (CD) were conducted in 26 villages of five clusters viz. Gauripur (78 CD), Rupshi (74 CD), Agomani (54 CD) Chapar Salkocha (82 CD), Mahamaya (112 CD), with NRCHB-101 (80 CD), PM-28 (120 CD), DRMR-150-35 (80 CD) varieties of Indian mustard and TS-38 (120 CD) variety of toria only under irrigated condition. Out of total 400 crop demonstrations, 14 crop demonstrations (03 nos. of PM-28, 02 nos. of DRMR-150-35, 02 no. of NRCHB-101 and 07 nos. of TS-38) had failed due to lack of irrigation facilities during critical growth phase of mustard crop and poor agronomic practices by some farmers. (Table 5 and 6).

The prevailing cropping pattern summer paddy-rapeseed/mustard-vegetables, summer paddy-black gram- Vegetables and jute- mustard-sali paddy. The sowing time spread from November 2 to 25, 2022 and harvesting period spread from February 10 to March 28, 2023. There was no severe infestation of pest and diseases. Some mild infestation of Sclerotinia Rot were was observed.

The demonstrated improved technologies (IP) in 386 successful demonstrations conducted in irrigated and rainfed situation gave an average seed yield of 1235 kg/ha against 669 kg/ha in FP with a yield improvement of 84.6% (Table 7). The cost of cultivation of Rs. 28797/ha in IP against the Rs. 21148/ha in FP was recorded that fetched GMR of Rs. 67308 /ha in IP against the Rs. 36461/ha in FP. An ANMR of Rs. 23198 /ha was realized against the additional cost of Rs. 7649 /ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.33) than that of FP (1.72) clearly indicates that demonstrated technologies in Dhubri district was economically viable and profitable.

Under irrigated condition, the overall performance of the demonstrated improved technologies (IP) in 107 successful demonstrations with all four varieties gave an average seed yield of 1389 kg/ha against 742 kg/ha in FP with a yield improvement of 87.1% (Table 8). The cost of cultivation of Rs. 32880/ha in IP against the Rs. 24595/ha in FP was recorded that fetched GMR of Rs. 75701/ha in IP against the Rs. 40439/ha in FP. An ANMR of Rs. 26976 /ha was realized against the additional cost of Rs. 8285 /ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.30) than that of FP (1.64) clearly indicates that demonstrated technologies in Dhubri district was economically viable and profitable.

The variety-wise analysis under irrigated condition (Fig. 16) shows that IP demonstrations with PM-28 (18 CD) recorded highest average seed yield of 1514 kg/ha against 812 kg/ha in FP with a yield improvement of 86.4% against the additional cost of cultivation of Rs. 7920/ha, while demonstrations with DRMR 150-35 (37 CD) had an average seed yield of 1439 kg/ha against 751 kg/ha in FP with maximum yield improvement of 91.6%. The IP demonstrated with NRCHB 101 (32 CD) had an average seed yield of 1380 kg/ha against 769 kg/ha in FP with a yield improvement of 79.45% and the IP demonstrations with TS-38 (20 CD) had an average seed yield of 1334 kg/ha against 706 kg/ha in FP with a yield improvement of 88.9%. The maximum ANMR (Rs. 30330 /ha) was reported from PM-28 variety, while minimum (Rs. 20739 /ha) from NRCHB 101. The cost of cultivation in IP ranged from Rs. 30040 /ha with TS-38 to Rs. 34225/ha with NRCHB-101, while in FP it ranged from Rs. 21665 /ha with NRCHB-101 to Rs. 25150/ha with DRMR-150-35. All demonstrated varieties had higher B:C ratio than that of FP.

Under rainfed condition, the demonstrated improved technologies (IP) in 279 successful demonstrations with all four varieties gave an average seed yield of 1080 kg/ha against 596 kg/ha in FP with a yield improvement of 81.2 % (Table 9). The cost of cultivation of Rs. 27231/ha in IP against the Rs. 19827/ha in FP was recorded that fetched GMR of Rs. 58860 /ha in IP against the Rs. 32482/ha in FP. An ANMR of Rs. 18969 /ha was realized against the additional cost of Rs. 7404 /ha

incurred due to demonstrated technology and the higher B:C ratio of IP (2.16) than that of FP (1.63) clearly indicates that demonstrated technologies in Dhubri district was economically viable and profitable.

The variety-wise analysis under rainfed condition (Fig. 17) shows that IP demonstrations with DRMR150-35 (41 CD) recorded highest average seed yield of 1240 kg/ha against 690 kg/ha in FP with highest yield improvement of 79.7 % against the additional cost of cultivation of Rs. 8050/ha, while demonstrations with PM-28 (99 CD) recorded an average seed yield of 1114 kg/ha against 622 kg/ha in FP with a yield improvement of 79.1 %. The IP demonstrations with NRCHB 101 (46 CD) had an average seed yield of 1041 kg/ha against 548 kg/ha in FP with a yield improvement of 90.0 %. The IP demonstrations with TS-38 (93 CD) had an average seed yield of 969 kg/ha against 497 kg/ha in FP with the maximum yield improvement of 95.0 %. The maximum ANMR (Rs. 21925/ha) from DRMR-150-35 variety, while minimum (Rs. 17704 /ha) from TS-38 was reported. The cost of cultivation in IP ranged from Rs. 26400/ha with TS-38 to Rs. 28200 /ha with DRMR-150-35, while in FP it ranged from Rs. 18380 /ha with TS-38 to Rs. 20800 /ha with NRCHB-101. All demonstrated varieties had higher B:C ratio than that of FP.

Fig 16: Performance of different varieties in Dhubri district of Assam in irrigated situation

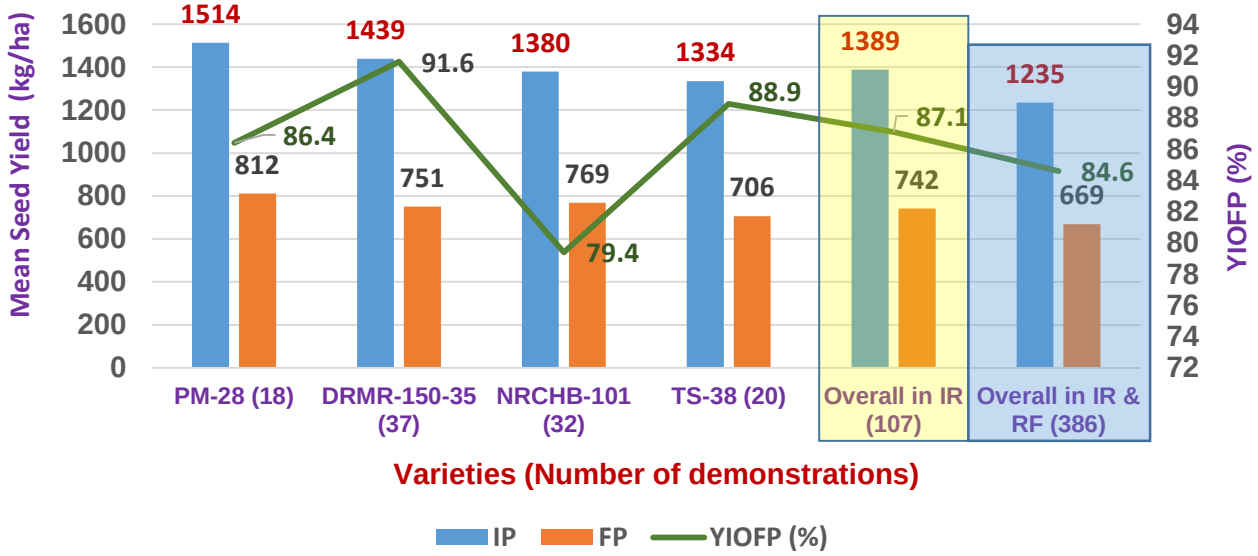
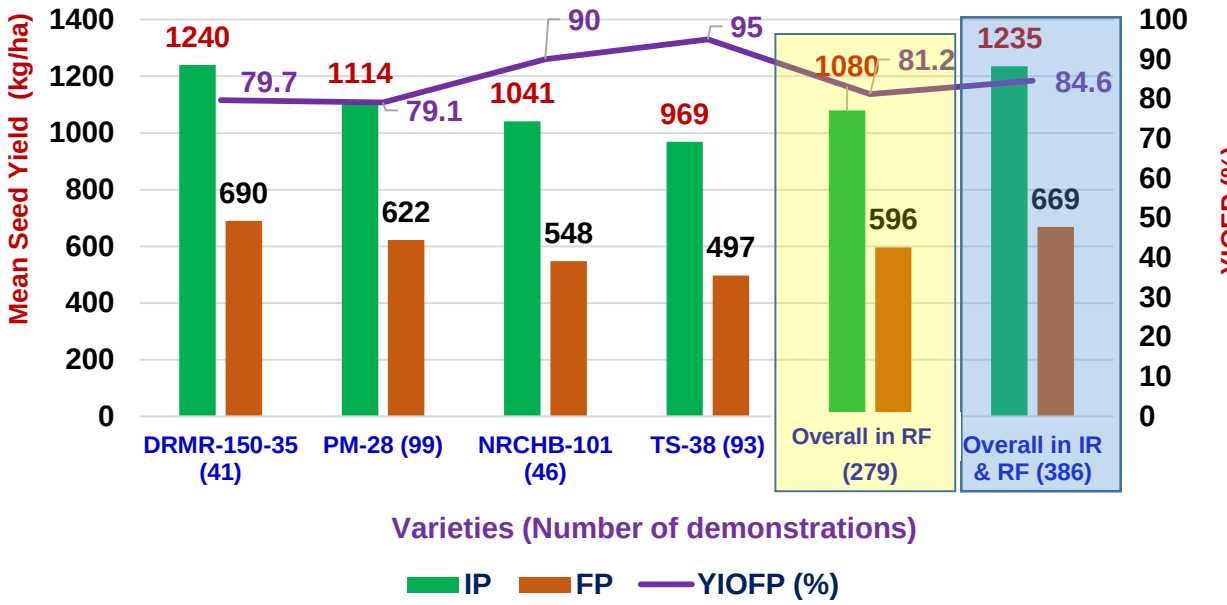


Fig 17: Performance of different varieties in Dhubri district of Assam in rainfed situation



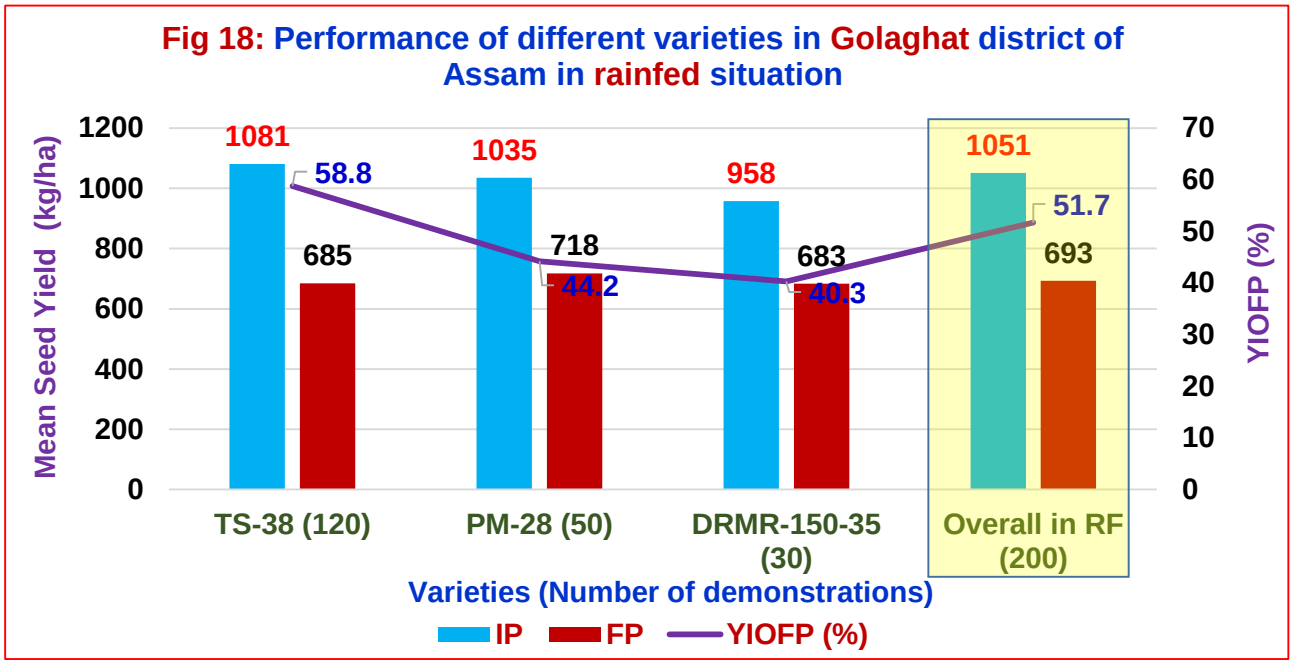
2.1.8. Performance of crop demonstrations in Golaghat district of Assam during 2022-23

In Golaghat district, 200 crop demonstrations (CD) were conducted in 27 villages of three clusters viz. Bokakhat (139 CD), Kakodonga (50 CD) and Podumoni (11 CD) with three varieties viz. PM-28 (50 CD), DRMR-150-35 (30 CD) of Indian mustard and TS-38 (120 CD) variety of toria only under rainfed conditions. (Table 5 and 6).

The prevailing cropping pattern was sali paddy-fallow, sali paddy-toria/ rabi vegetables, boro paddy-toria/ potato/ black gram and summer vegetables-rapeseed-mustard/ potato/ rabi vegetables. The sowing time spread from November 10 to Dec. 10, 2022 and harvesting period spread from February 14 to March 26, 2023. The mild infestation of mustard sawfly at early stage and severe infestation of Sclerotinia rot especially in Indian mustard was observed in some plots.

Under rainfed condition, the demonstrated improved technologies (IP) in successful 200 crop demonstrations gave an average seed yield of 1051 kg/ha against 693 kg/ha in FP with a yield improvement of 51.7 % (Table 9).The cost of cultivation of Rs. 26048/ha in IP against the Rs. 22082/ha in FP was recorded that fetched GMR of Rs. 57280/ha in IP against the Rs. 37769 ha in FP. An ANMR of Rs. 15545 /ha was realized against the additional cost of Rs. 3966/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.19) than that of FP (1.71) clearly indicates that demonstrated technologies in Golaghat district was economically viable and profitable.

The variety-wise analysis of Indian mustard under rainfed condition (Fig. 18) shows that IP demonstrations with PM-28 (50 CD) recorded average seed yield of 1035 kg/ha against 718 kg/ha in FP with a yield improvement of 44.2% against the additional cost of cultivation of Rs. 4273/ha, while demonstrations with variety DRMR-150-35 (30 CD) recorded an average seed yield of 958 kg/ha against 683 kg/ha in FP with a yield improvement of 40.3%. The IP demonstrations of improved toria variety, TS-38 (120 CD) had an overall highest average seed yield of 1081 kg/ha against 685 kg/ha in FP with highest yield improvement of 58.8%. The maximum ANMR (Rs.17797/ha) from TS-38 variety, while minimum (Rs. 10807 /ha) from DRMR-150-35 was reported. The cost of cultivation in IP ranged from Rs. 25977 /ha with DRMR-150-35 to Rs. 26318/ha with PM-28, while in FP it ranged from Rs. 22169 /ha with TS-38 to Rs. 21794/ha with DRMR-150-35. All demonstrated varieties had higher B:C ratio than that of FP.



2.1.9. Performance of crop demonstrations in Jorhat district of Assam during 2022-23

In Jorhat, 300 crop demonstrations (CD) were conducted in 53 villages of four clusters viz. Majuli (80 CD), Ujani Majuli (90 CD), Dhekorgorah (30 CD) and Kaliapani (100 CD) with NRCHB-101 (50 CD), PM-28 (100 CD), DRMR-150-35 (50CD) varieties of Indian mustard and TS-38 (100 CD) variety of toria only under rainfed condition. (Table 5 and 6).

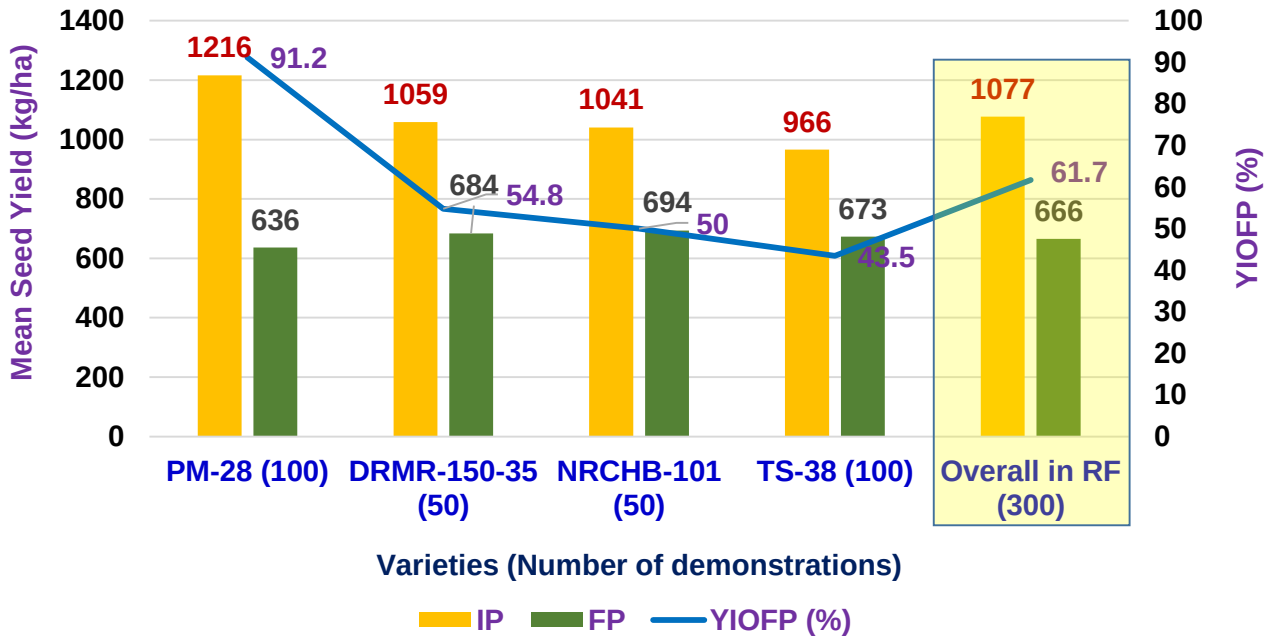
The prevailing cropping pattern was sali paddy-fallow, sali paddy-toria/ rabi vegetables and sali paddy-maize/sugarcane. The sowing time spread from November 5 to December 15, 2022 and harvesting period spread from February 20 to March 30, 2023. There was no severe infestation of pest and diseases.

Under rainfed condition, the demonstrated improved technologies (IP) in 300 successful crop demonstrations gave an average seed yield of 1077 kg/ha against 666 kg/ha in FP with a yield improvement of 61.7% (Table 9). The cost of cultivation of Rs. 27573/ha in IP against the Rs. 23752/ha in FP was recorded that fetched GMR of Rs. 58697 /ha in IP against the Rs. 36297/ha in FP. An ANMR of Rs. 18579 /ha was realized against the additional cost of Rs. 3821/ha incurred due

to demonstrated technology and the higher B:C ratio of IP (2.12) than that of FP (1.52) clearly indicates that demonstrated technologies in Jorhat district was economically viable and profitable.

The variety-wise analysis under rainfed condition (Fig. 19) shows that IP demonstrations with PM-28 (100 CD) recorded highest average seed yield of 1216 kg/ha against 636 kg/ha in FP with highest yield improvement of 91.2% against the additional cost of cultivation of Rs. 3839/ha, while demonstrations with DRMR-150-35 (50 CD) recorded an average seed yield of 1059 kg/ha against 684 kg/ha in FP with a yield improvement of 54.8%. The IP demonstrations with NRCHB-101 (50 CD) had an average seed yield of 1041 kg/ha against 694 kg/ha in FP with a yield improvement of 50.0%. The IP demonstrations with TS-38 (100 CD) had an average seed yield of 966 kg/ha against 673 kg/ha in FP with a yield improvement of 43.5%. The maximum ANMR (Rs. 27771/ha) from PM-28 variety, while minimum (Rs.12475 /ha) from TS-38 was reported. The cost of cultivation in IP ranged from Rs. 26732 /ha with TS-38 to Rs. 28997/ha with NRCHB-101, while in FP it ranged from Rs. 23239 /ha with TS-38 to Rs. 24610/ha with NRCHB-101. All demonstrated varieties had higher B:C ratio than that of FP.

Fig 19: Performance of different varieties in Jorhat district of Assam in rainfed situation



2.1.10. Performance of crop demonstrations in Kamrup district of Assam during 2022-23

In Kamrup, 400 crop demonstrations (CD) were conducted in 21 villages of five clusters viz. Chandrapur (20 CD), Kamalpur (60 CD), Bihdiya jajikona (170) Hajo (70 CD) and Sualkuchi (80 CD) with PM-28 (100 CD), DRMR-150-35 (80 CD) varieties of Indian mustard and TS-38 (220 CD) variety of toria under both irrigated (121 CD) and rainfed (276 CD) conditions (Table 5 and 6). Out of 400 crop demonstrations, 3 crop demonstrations (2 TS-38 and 1 of DRMR-150-35) were failed due to poor germination and poor management by farmers.

The prevailing cropping pattern was sali paddy-vegetable-rapeseed/mustard, sali paddy-boro paddy, fallow (summer)-vegetable/ mustard, summer vegetable-toria/rabi vegetables. The sowing time spread from November 4 to December 5 2022 and harvesting period spread from February 10 to March 25, 2023. There was no severe infestation of pest and diseases. Some incidence of mustard sawfly, mustard aphid and Alterneria bight and Sclerotinia rot was observed below economic threshold level.

The demonstrated improved technologies (IP) in 397 successful crop demonstrations gave an average seed yield of 990 kg/ha against 669 kg/ha in FP with a yield improvement of 48.0% (Table 7). The cost of cultivation of Rs. 24962/ha in IP against the Rs. 22789/ha in FP was recorded that fetched GMR of Rs. 53955 /ha in IP against the Rs. 36461/ha in FP. An ANMR of Rs. 15321/ha was realized against the additional cost of Rs. 2173/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.16) than that of FP (1.59) clearly indicates that demonstrated technologies in Kamrup district was economically viable and profitable.

Under irrigated condition, the overall performance of demonstrated technologies in 121 successful crop demonstrations with all three varieties (PM-28, DRMR-150-35 and TS-38) recorded an average seed yield of 1290 kg/ha against 833 kg/ha in FP with a yield improvement of 54.9 % (Table 8). The cost of cultivation of Rs. 27608/ha in IP against the Rs. 25065/ha in FP was recorded that fetched GMR of Rs. 70305/ha in IP against the Rs. 43399/ha in FP. An ANMR of Rs. 22363 /ha was realized against the additional cost of Rs. 2543/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.54) than that of FP (1.81).

The variety-wise analysis under irrigated condition (Fig. 20) shows that IP demonstrations with DRMR-150-35 (55 CD) recorded highest average seed yield of 1450 kg/ha against 856 kg/ha in FP with highest yield improvement of 69.4 % against the additional cost of cultivation of Rs. 2780/ha, while demonstrations with PM-28 (25 CD) had an average seed yield of 1427 kg/ha against 887 kg/ha in FP with a yield improvement of 60.9%. The IP demonstrations with TS-38 (41CD) had an average seed yield of 993 kg/ha against 769 kg/ha in FP with a yield improvement of 29.1 %. The maximum ANMR (Rs. 29593 /ha) was reported from DRMR-150-35 variety, while minimum (Rs. 10040 /ha) from TS-38. The cost of cultivation in IP ranged from Rs. 27738 /ha with DRMR-150-35 to Rs. 27496/ha with TS-38, while in FP it ranged from Rs. 24868/ha with PM-28 to Rs. 25328/ha with TS-38. All demonstrated varieties had higher B:C ratio than that of FP.

Under rainfed condition, the overall performance of demonstrated technologies in 276 successful crop demonstrations with three varieties (DRMR-150-35, PM-28 and TS-38) recorded average seed yield of 963 kg/ha against 679 kg/ha in FP with yield improvement 41.8% (Table 9). The cost of cultivation of Rs. 23791/ha in IP against the Rs. 21775/ha in FP was recorded that fetched GMR of Rs.52484/ha in IP against the Rs. 37006/ha in FP. An ANMR of Rs. 13534 /ha was realized against the additional cost of Rs. 2016/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.20) than that of FP (1.69).

The variety-wise analysis under rainfed condition (Fig. 21) shows that IP demonstrations with DRMR-150-35 (24 CD) recorded highest average seed yield of 1075 kg/ha against 670 kg/ha in FP with highest yield improvement of 60.4% against the additional cost of cultivation of Rs. 2062/ha, while demonstrations with PM-28 (75 CD) recorded an average seed yield of 1070 kg/ha against 691 kg/ha in FP with a yield improvement of 54.8 %. The IP demonstrations with TS-38 (177 CD) had an average seed yield of 903 kg/ha against 676 kg/ha in FP with a yield improvement of 33.6 %. The maximum ANMR (Rs. 20011/ha) from DRMR-150-35 variety, while minimum (Rs. 10346/ha) from TS-38 was reported. The cost of cultivation in IP ranged from Rs. 24051/ha with DRMR 150-35 to Rs. 23685/ha with TS-38, while in FP it ranged from Rs. 21659/ha with TS-38 to Rs. 21989/ha with DRMR-150-35. All demonstrated varieties had higher B:C ratio than that of FP.

Fig 20: Performance of different varieties in Kamrup district of Assam in irrigated situation

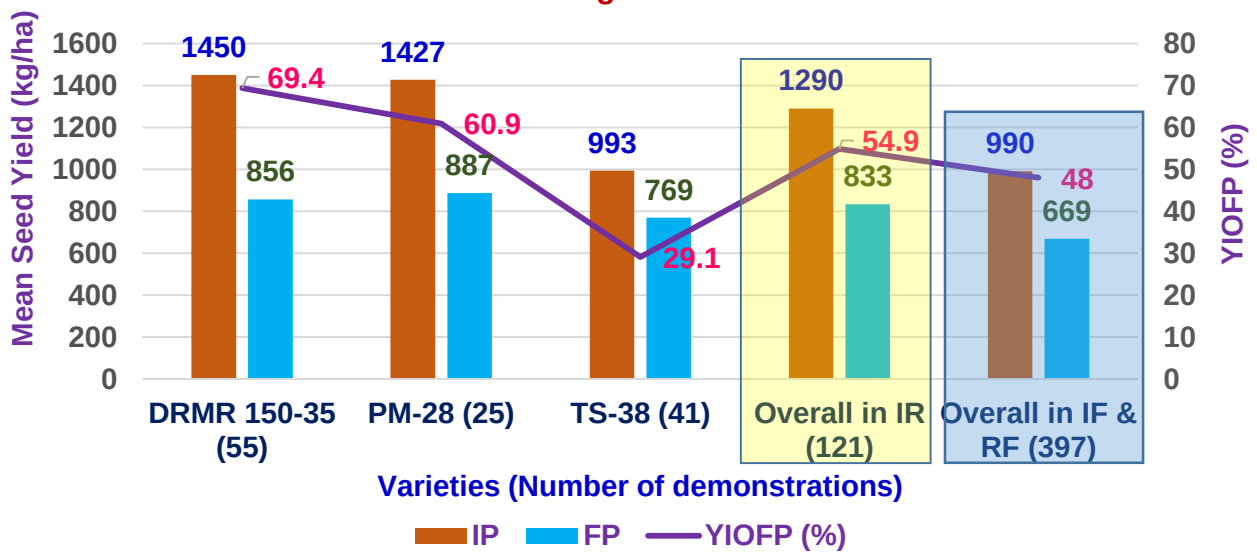
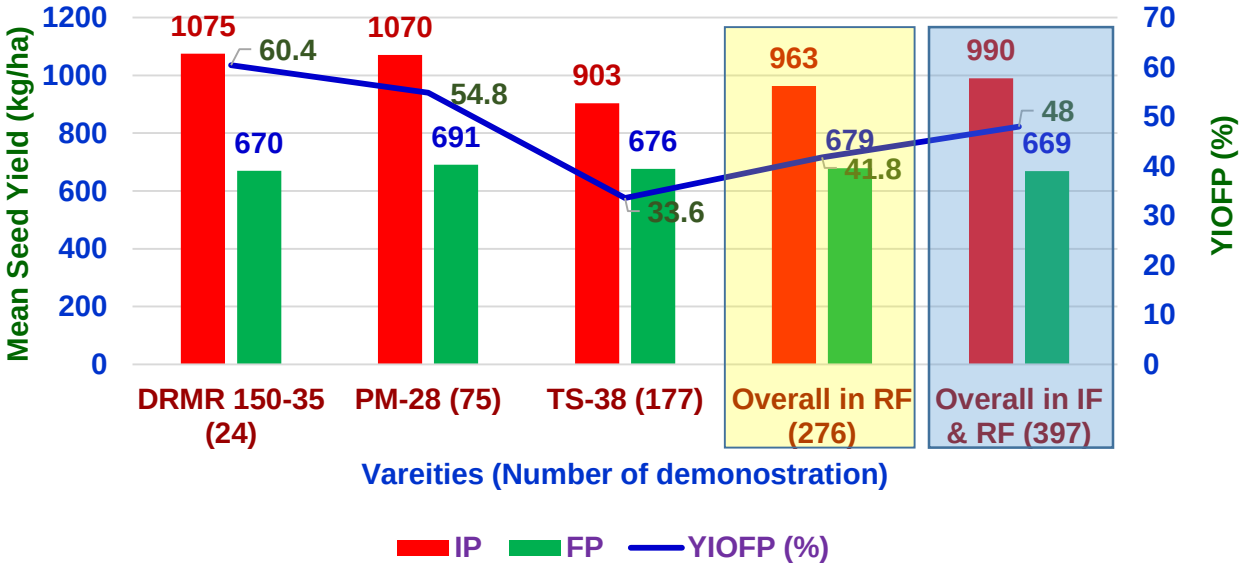


Fig 21: Performance of different varieties in Kamrup district of Assam in rainfed situation



2.1.11. Performance of crop demonstrations in Kokrajhar district of Assam during 2022-23

In Kokrajhar, 300 crop demonstrations (CD) were conducted in 55 villages of three clusters viz. Kokrajhar (85 CD), Dotma (85 CD) and Kachugaon (130 CD) with NRCHB-101 (50 CD), PM-28 (80 CD), DRMR-150-35 (50 CD) varieties of Indian mustard and TS-38 (120 CD) variety of toria under both irrigated (37 CD) and rainfed (249 CD) conditions (Table 5 and 6).

The prevailing cropping pattern was Sali paddy- potato, Sali paddy- rapeseed, sali paddy-rapeseed- maize, sali paddy- wheat-vegetable, Sali paddy - fallow/ vegetable - boro paddy and sali paddy – fallow. The sowing time spread from November 4 to 30, 2022 and harvesting period spread from February 16 to March 22, 2023. There was no severe infestation of pest and diseases. Some incidence of mustard aphid and Alterneria bight was observed below economic threshold level.

The demonstrated improved technologies (IP) in 286 demonstrations gave an average seed yield of 949 kg/ha against 685 kg/ha in FP with a yield improvement of 38.5% (Table 7). The cost of cultivation of Rs. 27044/ha in IP against the Rs. 21037/ha in FP was recorded that fetched GMR of Rs. 51721 /ha in IP against the Rs. 37333/ha in FP. An ANMR of Rs. 8381 /ha was realized against the additional cost of Rs. 6007/ha incurred due to demonstrated technology and the higher B: C ratio of IP (1.91) than that of FP (1.77) clearly indicates that demonstrated technologies in Kokrajhar district was economically viable and profitable.

Under irrigated condition, the overall performance of demonstrated technologies in 37 demonstrations with all three varieties (NRCHB-101, PM-28 and DRMR-150-35) recorded an average seed yield of 1122 kg/ha against 721 kg/ha in FP with a yield improvement of 55.6% (Table 8). The cost of cultivation of Rs. 32061/ha in IP against the Rs. 23127/ha in FP was recorded that fetched GMR of Rs. 61149 /ha in IP against the Rs.39295/ha in FP. An ANMR of Rs. 12920 /ha was realized against the additional cost of Rs. 8934/ha incurred due to demonstrated technology and the higher B:C ratio of IP (1.90) than that of FP (1.69).

The variety-wise analysis under irrigated condition (Fig. 22) shows that IP demonstrations with DRMR-150-35 (11 CD) recorded highest average seed yield of 1138 kg/ha against 715 kg/ha in FP with highest yield improvement of 59.1% against the additional cost of cultivation of Rs. 9301/ha, while demonstrations with PM-28 (16 CD) had an average seed yield of 1117 kg/ha against 720 kg/ha in FP with a yield improvement of 55.1%. The IP demonstrations with NRCHB-101 (10 CD) recorded an average seed yield of 1112 kg/ha against 731 kg/ha in FP with a yield improvement of 52.1%. The maximum ANMR (Rs. 13279 /ha) was reported from PM-28 variety, while minimum (Rs. 11311/ha) from NRCHB-101. The cost of cultivation in IP ranged from Rs. 31650/ha with PM-28 to Rs. 32480/ha with NRCHB-101, while in FP it ranged from Rs. 22977 /ha with DRMR-150-35 to Rs. 23292/ha with PM-28. All demonstrated varieties had higher B:C ratio than that of FP.

Under rainfed condition, the overall performance of demonstrated technologies in 249 demonstrations with all four varieties recorded average seed yield of 924 kg/ha against 679 kg/ha in FP with yield improvement of 36.0% (Table 9). The cost of cultivation of Rs. 26295/ha in IP against the Rs. 20719/ha in FP was recorded that fetched GMR of Rs. 50358 /ha in IP against the Rs. 37006/ha in FP. An ANMR of Rs. 7776/ha was realized against the additional cost of Rs. 5576/ha incurred due to demonstrated technology and the higher B:C ratio of IP (1.91) than that of FP (1.78).

The variety-wise analysis under rainfed condition (Fig. 23) shows that IP demonstrations with PM-28 (53 CD) recorded highest average seed yield of 956 kg/ha against 710 kg/ha in FP with a yield improvement of 34.6% against the additional cost of cultivation of Rs. 5491/ha, while demonstrations with NRCHB-101 (37 CD) recorded an average seed yield of 922 kg/ha against 663 kg/ha in FP with highest yield improvement of 39.0%. The IP demonstrations with DRMR-150-35 (39 CD) had an

average seed yield of 909 kg/ha against 657 kg/ha in FP with a yield improvement of 38.3%. The IP demonstrations with TS-38 (120 CD) had an average seed yield of 914 kg/ha against 678 kg/ha in FP with a yield improvement of 34.8%. The maximum ANMR (Rs. 8447 /ha) from NRCHB-101 variety, while minimum (Rs. 7205 /ha) from TS-38 was reported. The cost of cultivation in IP ranged from Rs. 26224/ha with TS-38 to Rs. 26438/ha with PM-28, while in FP it ranged from Rs. 20567 /ha with TS-38 to Rs. 20948/ha with NRCHB-101. All demonstrated varieties had higher B:C ratio than that of FP.

Fig 22: Performance of different varieties in Kokrajhar district of Assam in irrigated situation

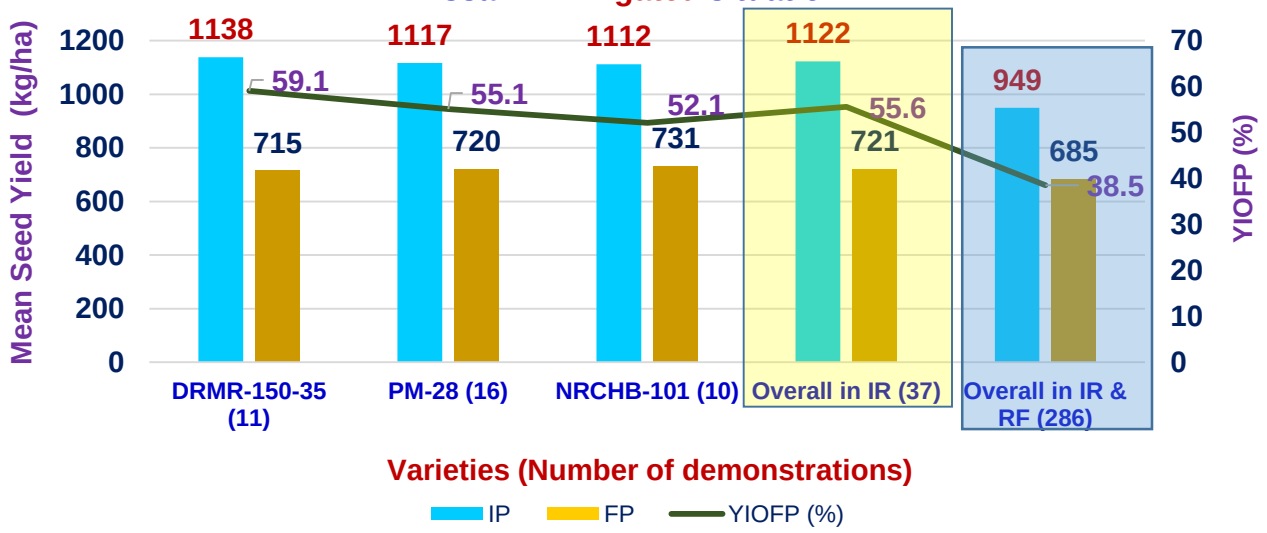
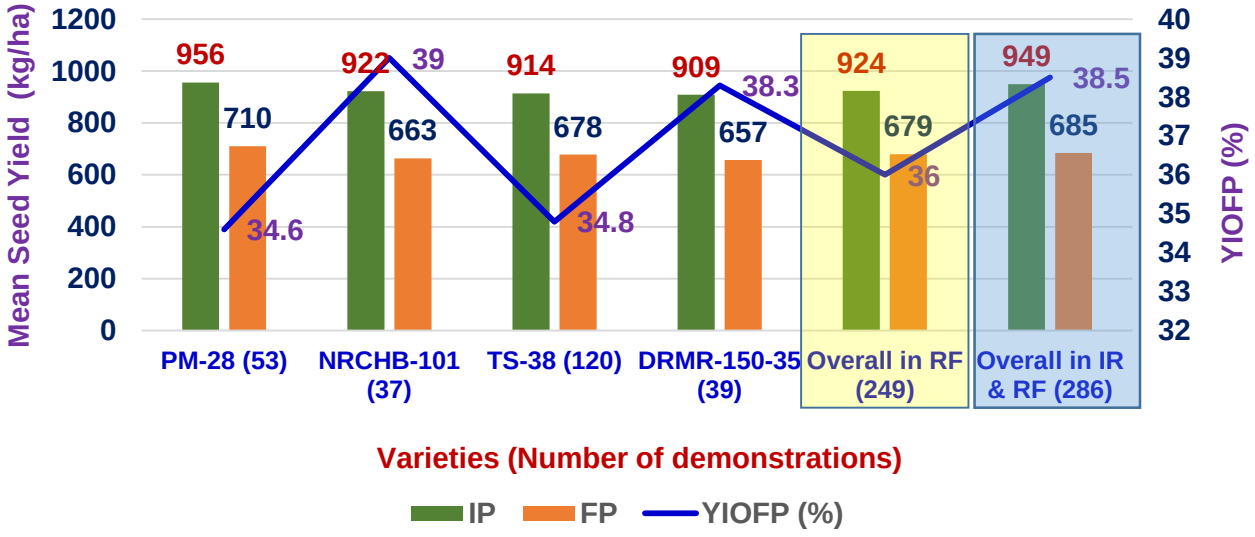


Fig 23: Performance of different varieties in Kokrajhar district of Assam in rainfed situation



2.1.12. Performance of crop demonstrations in Lakhimpur district of Assam during 2022-23

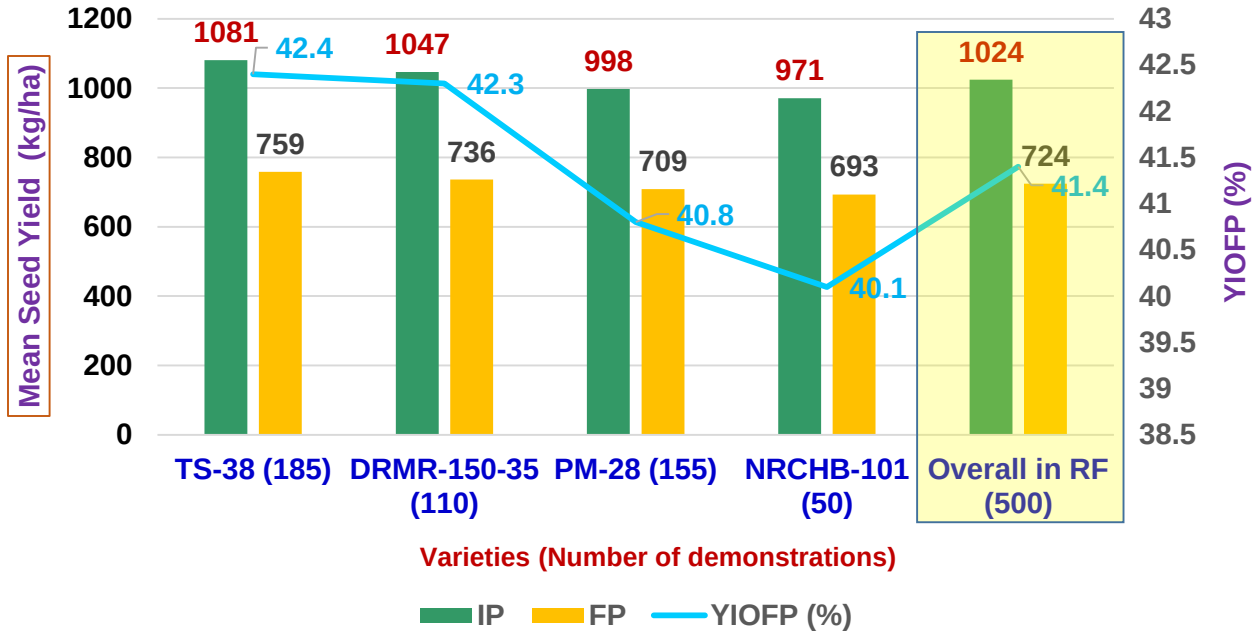
In Lakhimpur, 500 crop demonstrations (CD) were conducted in 77 villages of Seven clusters viz. Telahi (60 CD), Narayanpur (80 CD), Bihpuria (50), Karunabari (50), Lakhimpur (60), Dhakuakhana (100) and Ghilamara (100 CD) with NRCHB-101 (50 CD), PM-28 (155 CD), DRMR-150-35 (110 CD) varieties of Indian mustard and TS-38 (185 CD) variety of toria only under rainfed conditions (Table 5 and 6).

The prevailing cropping pattern was winter rice-rapeseed & mustard, winter rice-potato, winter rice-summer paddy, winter rice as mono crop, and rapeseed & mustard as mono crop. The sowing time spread from second to fourth week of November 16 to December 7, 2022 and harvesting period spread from February 24 to March 26 2023. There was no severe infestation of pest and diseases. The infestation of mustard sawfly, mustard aphid and Alternaria blight were found in some areas, however no major damage was observed. Rodent attacks on mustard were also reported in some fields of Dhakuakhana and Ghilamara blocks of the district.

Under rainfed condition, the demonstrated improved technologies (IP) in 500 demonstrations gave an average seed yield of 1024 kg/ha against 724 kg/ha in FP with highest yield improvement of 41.4 % (Table 9). The cost of cultivation of Rs. 23785/ha in IP against the Rs. 20615/ha in FP was recorded that fetched GMR of Rs. 55808 /ha in IP against the Rs. 39458/ha in FP. An ANMR of Rs. 13180/ha was realized against the additional cost of Rs. 3170 /ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.34) than that of FP (1.91) clearly indicates that demonstrated technologies in Lakhimpur district was economically viable and profitable.

The variety-wise analysis under rainfed condition (Fig. 24) shows that IP demonstrations with TS-38 (185 CD) recorded highest average seed yield of 1081 kg/ha against 759 kg/ha in FP with highest yield improvement of 42.4% against the additional cost of cultivation of Rs. 3234/ha, while demonstrations with DRMR-150-35 (110 CD) recorded an average seed yield of 1047 kg/ha against 736 kg/ha in FP with a yield improvement of 42.3%. The IP demonstrations with PM-28 (155 CD) had an average seed yield of 998 kg/ha against 709 kg/ha in FP with yield improvement of 40.8%. The IP demonstrations with NRCHB-101 (50 CD) had an average seed yield of 971 kg/ha against 693 kg/ha in FP with a yield improvement of 40.1%. The maximum ANMR (Rs. 14315 /ha) from TS-38 variety, while minimum (Rs. 11946 /ha) from NRCHB-101 was reported. The cost of cultivation in IP ranged from Rs. 23690/ha with PM-28 to Rs. 23887/ha with DRMR-150-35, while in FP it ranged from Rs. 20506 /ha with NRCHB-101 to Rs. 20807/ha with DRMR-150-35. All demonstrated varieties had higher B:C ratio than that of FP.

Fig 24: Performance of different varieties in Lakhimpur district of Assam in rainfed situation



2.1.13. Performance of crop demonstrations in Morigaon district of Assam during 2022-23

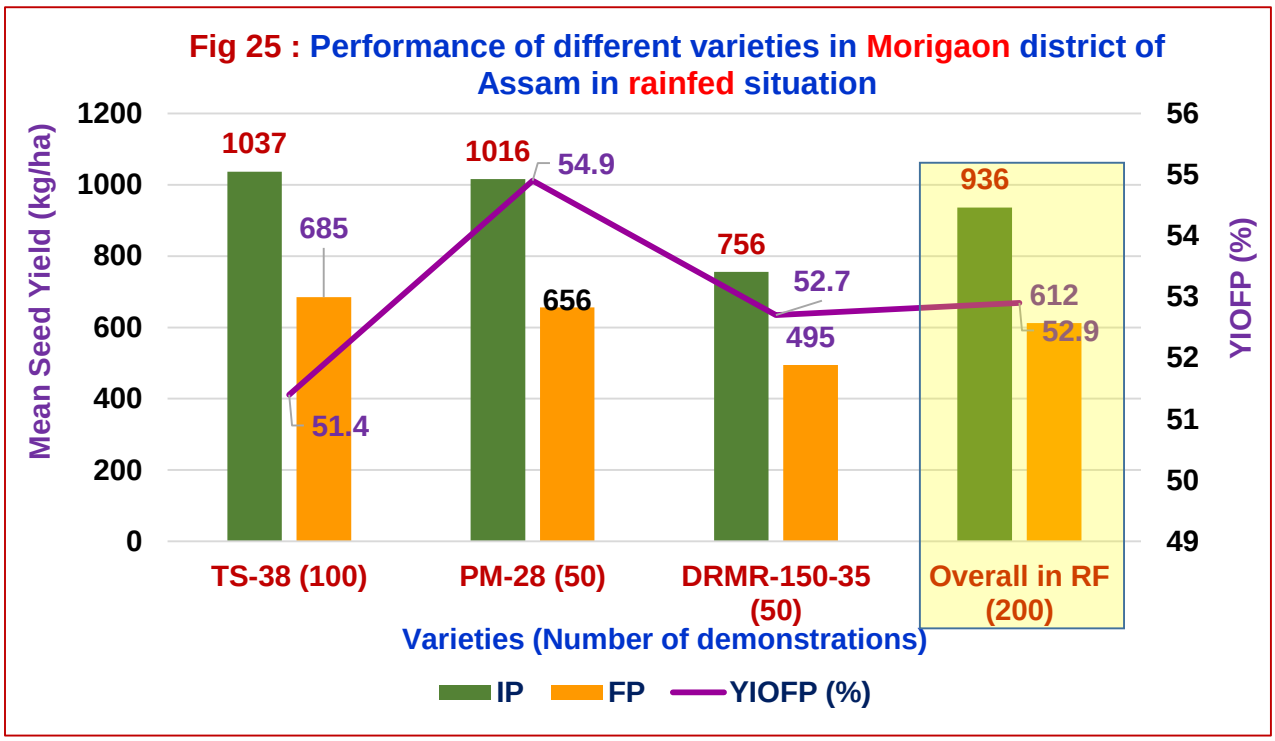
In Morigaon, 200 crop demonstrations (CD) were conducted in 15 villages of three clusters viz. Mayong (80 CD), Kapili (20 CD) and Bhurbandha (100 CD) with PM-28 (50 CD), DRMR-150-35 (50 CD) varieties of Indian mustard and TS-38 (100 CD) variety of toria under rainfed (200 CD) conditions (Table 5 and 6).

The prevailing cropping pattern was sali paddy-rapeseed/mustard-vegetables, jute-mustard/rapeseed-jute, sali paddy–rapeseed–Boro paddy, sali paddy- mustard/rapeseed- Jute. The sowing time spread from Nov 8, to December 5, 2022 and harvesting period spread from February 18, to March 25, 2023. There was no severe infestation of pest and diseases. Some incidence of mustard sawfly, mustard aphid and Alternaria bight was observed below economic threshold level.

Under rainfed condition, the demonstrated improved technologies (IP) in 200 successful crop demonstrations gave an average seed yield of 936 kg/ha against 612 kg/ha in FP with a yield improvement of 52.9% (Table 9). The cost of cultivation of Rs. 24031/ha in IP against the Rs. 21178/ha in FP was recorded that fetched GMR of Rs. 51012 /ha in IP against the Rs. 33354/ha in FP. An ANMR of Rs. 14805/ha was realized against the additional cost of Rs. 2853/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.12) than that of FP (1.57) clearly indicates that demonstrated technologies in Morigaon district was economically viable and profitable.

The variety-wise analysis under rainfed condition (Fig. 25) shows that IP demonstrations with TS-38 (100 CD) recorded highest average seed yield of 1037 kg/ha against 685 kg/ha in FP with a yield improvement of 51.4% against the additional cost of cultivation of Rs. 3275/ha, while demonstrations with PM-28 (50 CD) recorded an average seed yield of 1016 kg/ha against 656 kg/ha in FP with a yield improvement of 54.9%. The IP demonstrations with DRMR-150-35 (50 CD) had an average seed yield of 756 kg/ha against 495 kg/ha in FP with a yield improvement of 52.7 %. The maximum ANMR (Rs. 17017/ha) from PM-28 variety, while minimum (Rs. 11543/ha) from DRMR-

150-35 was reported. The cost of cultivation in IP ranged from Rs. 23309 /ha with DRMR-150-35 to Rs. 24754/ha with TS-38, while in FP it ranged from Rs. 20628 /ha with DRMR-150-35 to Rs. 21479/ha with TS-38. All demonstrated varieties had higher B:C ratio than that of FP.



2.1.14. Performance of crop demonstrations in Nagaon district of Assam during 2022-23

In Nagaon, 400 crop demonstrations (CD) were conducted in 52 villages of five clusters viz. Raha (110 CD), Khagorijan (70 CD), Koliabor (100 CD), Pachim Kaliabor (60 CD) and Batadraba (60 CD) with NRCHB-101 (70 CD), PM-28 (100 CD), DRMR-150-35 (100 CD) varieties of Indian mustard and TS-38 (130 CD) variety of toria under irrigated (106 CD) and rainfed (277 CD) conditions (Table 5 and 6). Out of 400 crop demonstrations, 17 demonstrations (5, DRMR-150-35, 2- NRCHB-101 and 10-PM-28) were failed due to cattle grazing, lack of soi moisture during sowing, late sowing and less ploughed field (Table 5 and 6)

The prevailing cropping patterns were sali/winter rice-toria-boro rice, sali /winter rice-toria/mustard- vegetables, sali/winter rice (Mono-cropping)-fallow, sali/winter rice- toria/mustard-jute. The sowing time spread from November 10 to December 12, 2022 and harvesting period spread from February 20 to March 26, 2023. The infestation of mustard sawfly, mustard aphid, rhizoctonia root rot, alternaria leaf spot, downy mildew was observed in Nagaon.

The demonstrated improved technologies (IP) in successful 383 demonstrations gave an average seed yield of 983 kg/ha against 694 kg/ha in FP with a yield improvement of 41.6%. (Table 7). The cost of cultivation of Rs. 23773/ha in IP against the Rs. 20633/ha in FP was recorded that fetched Rs. 53574 /ha in IP against the Rs. 37823/ha in FP. An ANMR of Rs. 12611/ha was realized against the additional cost of Rs. 3140 /ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.25) than that of FP (1.83) clearly indicates that demonstrated technologies in Nagaon district was economically viable and profitable.

Under irrigated condition, the overall performance of demonstrated technologies in 106 demonstrations with all four varieties recorded an average seed yield of 1225 kg/ha against 837 kg/ha in FP with a yield improvement of 46.4% (Table 8). The cost of cultivation of Rs. 28474/ha in IP against the Rs. 24789/ha in FP was recorded that fetched Rs. 66763 /ha in IP against the Rs. 45617/ha in FP. An ANMR of Rs. 17461 /ha was realized against the additional cost of Rs. 3685/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.34) than that of FP (1.84).

The variety-wise analysis under irrigated condition (Fig. 26) shows that IP demonstrations with PM-28 (34CD) recorded highest average seed yield of 1330 kg/ha against 864 kg/ha in FP with highest yield improvement of 53.9% against the additional cost of cultivation of Rs. 4743/ha, while demonstrations with NRCHB-101 (19 CD) had an average seed yield of 1236 kg/ha against 822 kg/ha in FP with a yield improvement of 50.4%.The IP demonstrations with DRMR-150-35 (24 CD) recorded an average seed yield of 1149 kg/ha against 818 kg/ha in FP with a yield improvement of 40.5%. The IP demonstrations with TS-38 (29 CD) had an average seed yield of 1159 kg/ha against 832 kg/ha in FP with a yield improvement of 39.3%. The maximum ANMR (Rs. 20654 /ha) was reported from PM-28 variety, while minimum (Rs. 15127 /ha) from TS-38. The cost of cultivation in IP ranged from Rs. 25000 /ha with TS-38 to Rs. 30086/ha with PM-28, while in FP it ranged from Rs. 22305 /ha with TS-38 to Rs. 26538/ha with DRMR-150-35. All demonstrated varieties had higher B:C ratio than that of FP.

Under rainfed condition, the overall performance of demonstrated technologies in 277 demonstrations with all four varieties recorded an average seed yield of 891 kg/ha against 640 kg/ha in FP with a yield improvement of 39.2% (Table 9). The cost of cultivation of Rs. 21974/ha in IP against the Rs. 19042/ha in FP was recorded that fetched Rs. 48560 /ha in IP against the Rs. 34880/ha in FP. An ANMR of Rs. 10748 /ha was realized against the additional cost of Rs. 2932 /ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.20) than that of FP (1.83).

The variety-wise analysis under rainfed condition (Fig. 27) shows that IP demonstrations with PM-28 (57 CD) recorded highest average seed yield of 979 kg/ha against 678kg/ha in FP with highest yield improvement of 44.4% against the additional cost of cultivation of Rs. 3469/ha, while demonstrations with DRMR 150-35 (72 CD) recorded an average seed yield of 810 kg/ha against 614 kg/ha in FP with a yield improvement of 31.9%. The IP demonstrations with NRCHB-101 (46 CD) had an average seed yield of 774 kg/ha against 562 kg/ha in FP with a yield improvement of 37.7%. The IP demonstrations with TS-38 (102 CD) had an average seed yield of 951kg/ha against 671kg/ha in FP with a yield improvement of 41.2%. The maximum ANMR (Rs. 12936 /ha) from PM-28 variety, while minimum (Rs. 7764 /ha) from DRMR-150-35 was reported. The cost of cultivation in IP ranged from Rs. 20553 /ha with TS-38 to Rs. 24217/ha with PM-28, while in FP it ranged from Rs. 17635 /ha with TS-38 to Rs. 20748/ha with PM-28. All demonstrated varieties had higher B: C ratio than that of FP.

Fig 26: Performance of different varieties in Nagaon district of Assam in irrigated situation

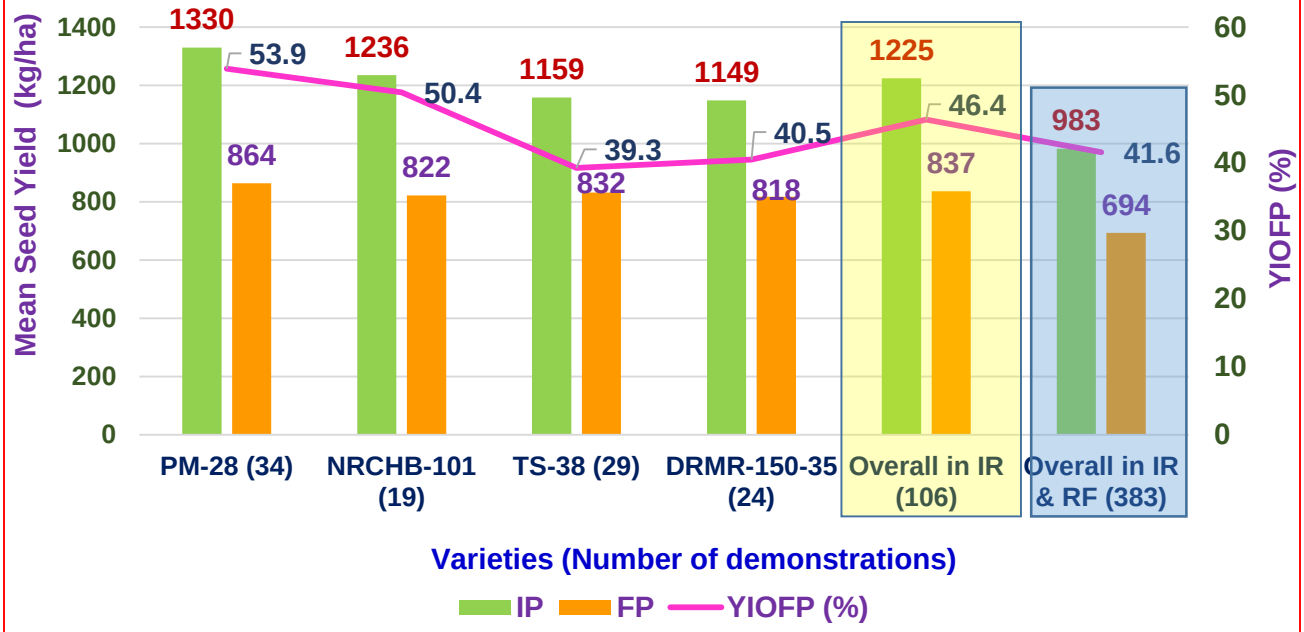
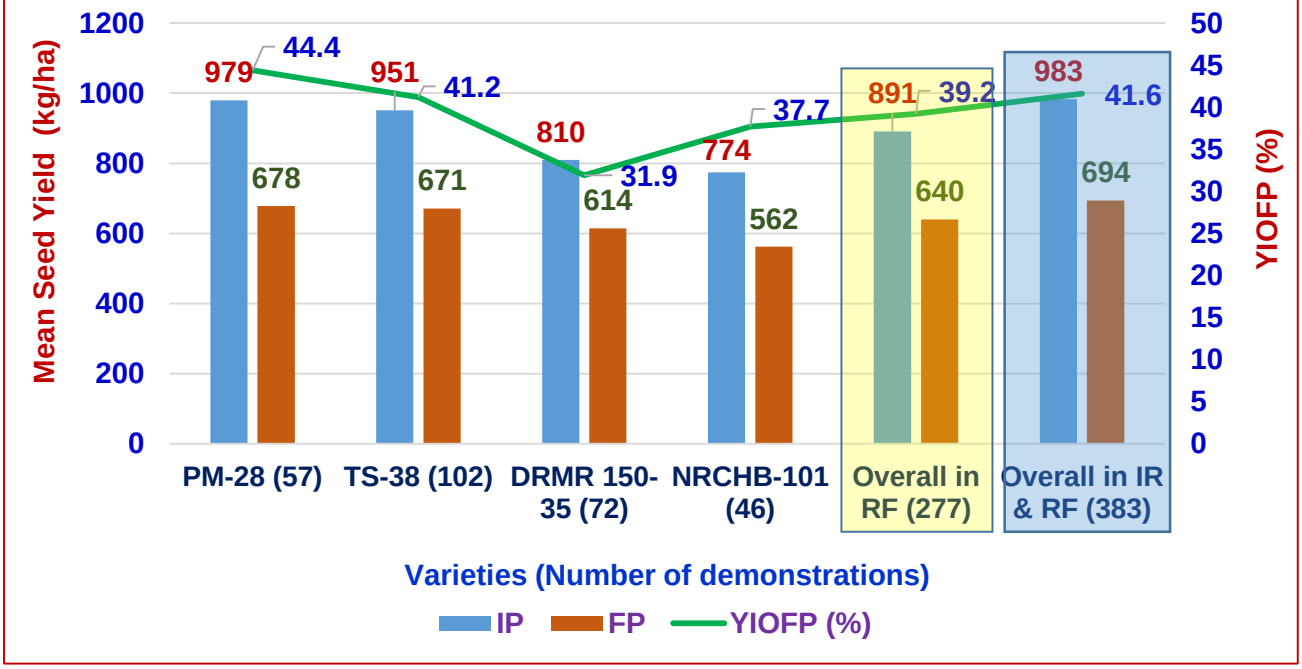


Fig 27: Performance of different varieties in Nagaon district of Assam in rainfed situation



2.1.15. Performance of crop demonstrations in Nalbari district of Assam during 2022-23

In Nalbari, 200 crop demonstrations (CD) were conducted in 24 villages of two clusters viz. Borigog-Banbhag (120 CD) and Barkhetri (80 CD) with PM-28 (60 CD), DRMR-150-35 (40 CD) varieties of Indian mustard and TS-38 (100 CD) variety of toria under irrigated (52 CD) and rainfed (141 CD) conditions (Table 5 and 6). Out of 200 crop demonstrations, 07 crop demonstrations (3 of PM-28 and 4 of TS-38) had failed because of poor germination which occurs due to poor land preparation, late sowing of the crop and also due to lack of moisture in the field.

The prevailing cropping pattern was sali paddy-mustard/ rabi vegetables, jute-mustard-summer paddy and sali paddy-mustard-summer paddy. The sowing time spread from Nov.8, 2022 to Dec. 15, 2022 and harvesting period spread from Feb.20 to March 20, 2023. There was no severe infestation of pest and diseases. Minor infestation of aphid and sawfly was observed in some fields.

The demonstrated improved technologies (IP) in successful 193 crop demonstrations gave an average seed yield of 946 kg/ha against 617 kg/ha in FP with a yield improvement of 54.1%. (Table 7). The cost of cultivation of Rs. 27055/ha in IP against the Rs. 21952/ha in FP was recorded that fetched GMR of Rs. 51557 /ha in IP against the Rs. 33463ha in FP. An ANMR of Rs. 12991 /ha was realized against the additional cost of Rs. 5103/ha incurred due to demonstrated technology and the higher B:C ratio of IP (1.90) than that of FP (1.52) clearly indicates that demonstrated technologies in Nalbari district was economically viable and profitable.

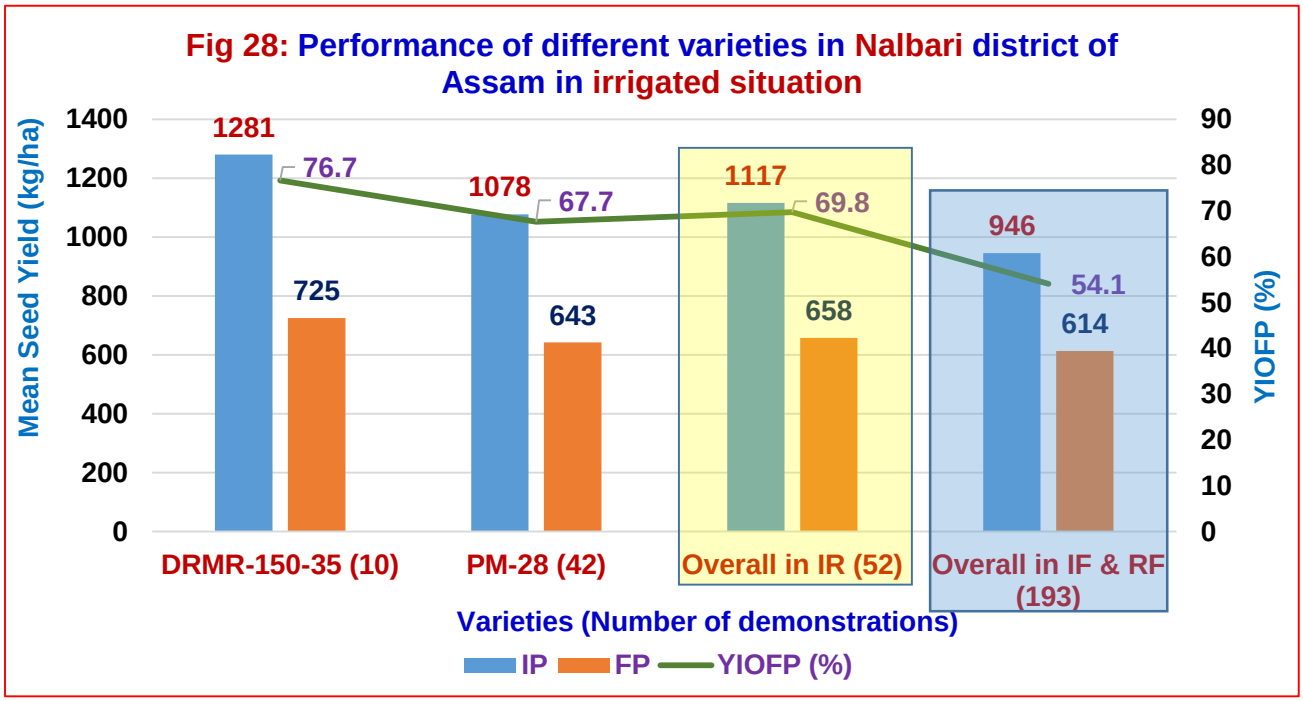
Under irrigated condition, the overall performance of demonstrated technologies in 52 demonstrations with two varieties (DRMR-150-35 and PM-28) recorded an average seed yield of 1117 kg/ha against 658 kg/ha in FP with a yield improvement of 69.8% (Table 8). The cost of cultivation of Rs. 28879/ha in IP against the Rs. 22561/ha in FP was recorded that fetched GMR of Rs. 60877/ha in IP against the Rs. 35861/ha in FP. An ANMR of Rs. 18698 /ha was realized against the additional cost of Rs. 6318 /ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.10) than that of FP (1.58).

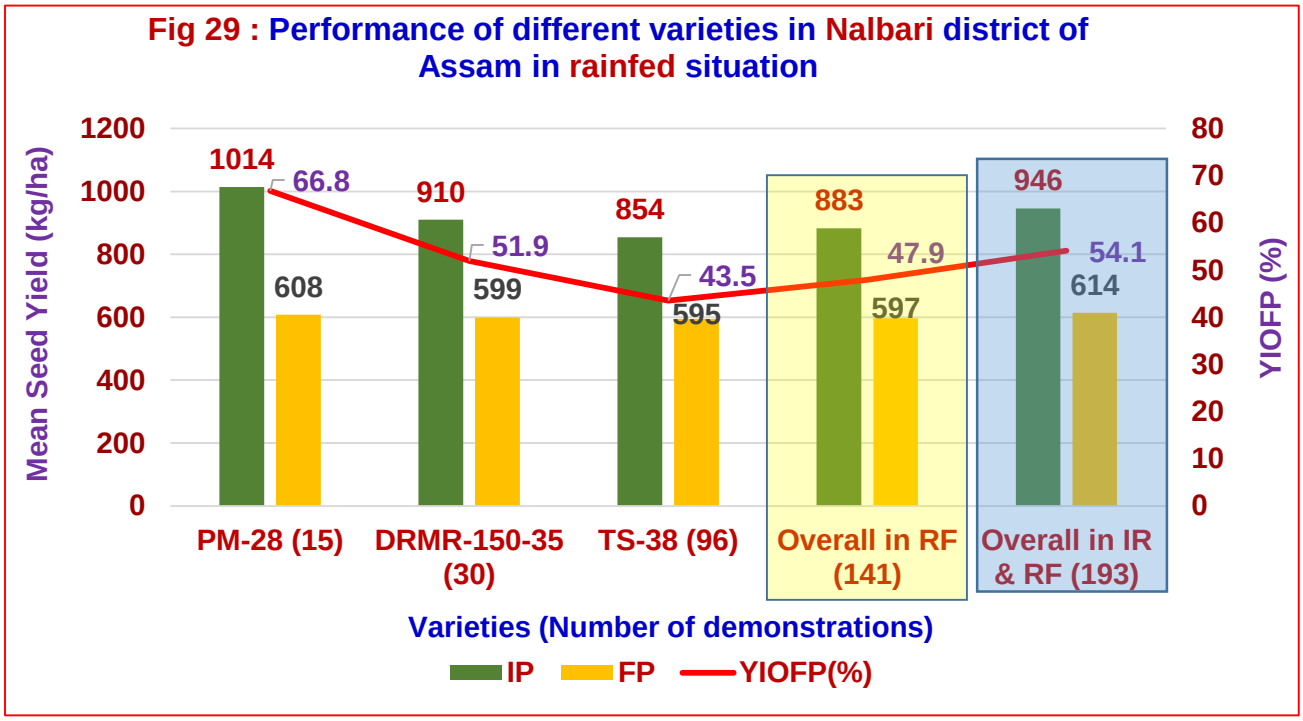
The variety-wise analysis under irrigated condition (Fig. 28) shows that IP demonstrations with DRMR150-35 (10CD) recorded highest average seed yield of 1281kg/ha against 725 kg/ha in FP with highest yield improvement of 76.7% against the additional cost of cultivation of Rs. 4085/ha, while demonstrations with PM-28 (42CD) had an average seed yield of 1078 kg/ha against 643 kg/ha in FP with a yield improvement of 67.7%. The maximum ANMR (Rs. 26217 /ha) was reported from DRMR150-35 variety, while minimum (Rs.16219/ha) from PM-28. The cost of cultivation in IP ranged from Rs. 27745/ha with DRMR150-35 to Rs. 29149/ha with PM-28, while in FP it ranged from Rs. 21661 /ha with PM-28 to Rs. 23660/ha with DRMR150-35. All demonstrated varieties had higher B:C ratio than that of FP.

Under rainfed condition, the overall performance of demonstrated technologies in 141 demonstrations with all three varieties recorded an average seed yield of 883 kg/ha against 597 kg/ha in FP with a yield improvement of 47.9% (Table 9). The cost of cultivation of Rs. 26382/ha in IP against the Rs. 21916/ha in FP was recorded that fetched GMR of Rs. 48124 /ha in IP against the Rs. 32537/ha in FP. An ANMR of Rs. 11121 /ha was realized against the additional cost of Rs. 4466/ha incurred due to demonstrated technology and the higher B:C ratio of IP (1.82) than that of FP (1.48).

The variety-wise analysis under rainfed condition (Fig. 29) shows that IP demonstrations with PM-28 (15 CD) recorded highest average seed yield of 1014 kg/ha against 608 kg/ha in FP with highest yield improvement of 66.8% against the additional cost of cultivation of Rs. 5230/ha, The IP demonstrations with DRMR 150-35 (30 CD) had an average seed yield of 910 kg/ha against 599 kg/ha in FP with a yield improvement of 51.9%. The IP demonstrations with TS-38 (96 CD) had an

average seed yield of 854 kg/ha against 595 kg/ha in FP with a yield improvement of 43.5%. The maximum ANMR (Rs. 16897 /ha) from PM-28 variety, while minimum (Rs. 9381 /ha) from TS-38 was reported. The cost of cultivation in IP ranged from Rs. 26182 /ha with PM-28 to Rs. 26590/ha with DRMR-150-35, while in FP it ranged from Rs. 20952 /ha with PM-28 to Rs. 23365/ha with DRMR-150-35. All demonstrated varieties had higher B:C ratio than that of FP.





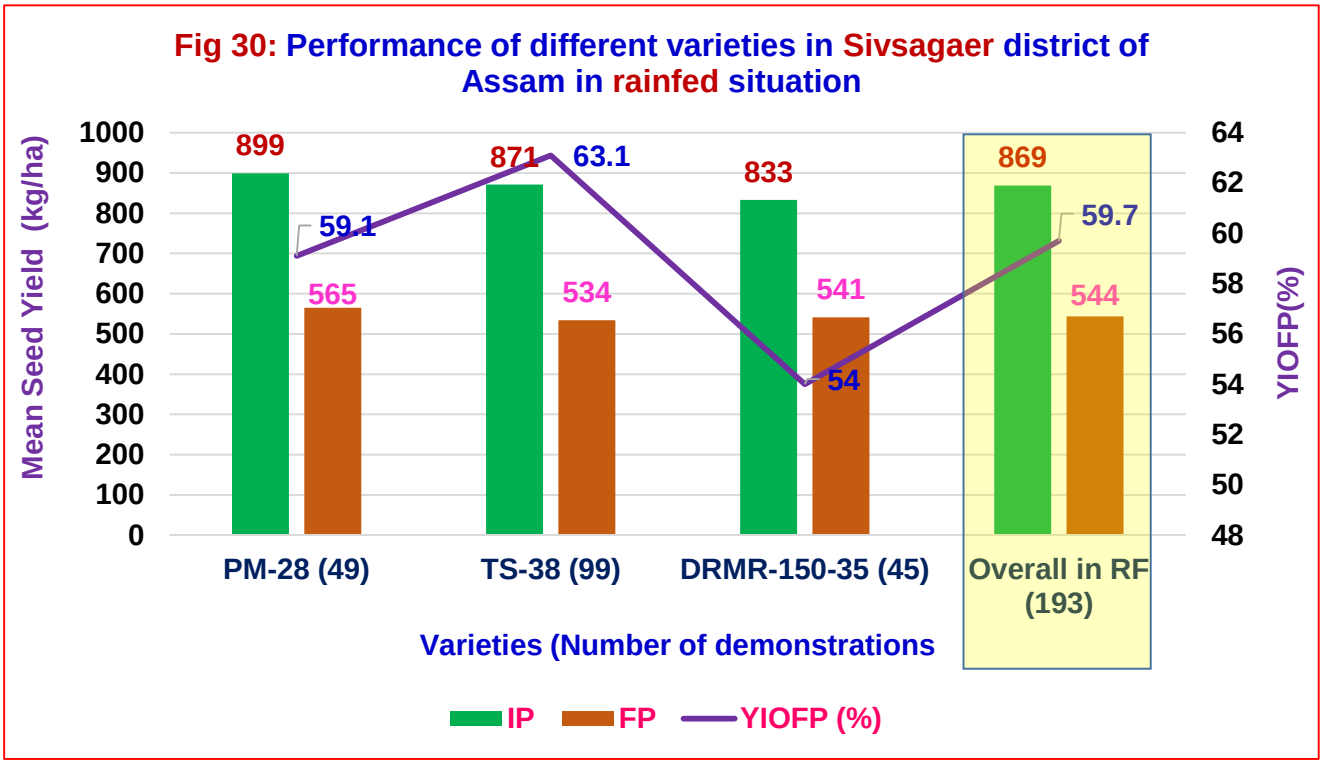
2.1.16. Performance of crop demonstrations in Sivasagar district of Assam during 2022-23

In Sivasagar, 200 crop demonstrations (CD) were conducted in 37 villages of three clusters viz. Demow (100 CD), Sivasagar (40 CD) and Gaurisagar (60 CD) with PM-28 (50 CD), DRMR-150-35 (50 CD) varieties of Indian mustard and TS-38 (100 CD) variety of toria only under rainfed condition. Out of 200 crop demonstrations, 7 crop demonstrations (01 of PM-28, 05 of DRMR 150-35 and 01 of TS-38) had failed due to cattle grazing in some demonstrations. There was good growth and proper germination, but drought like conditions arose in the field later on and no irrigation was applied (Table 5 and 6).

The prevailing cropping pattern rice-fallow-rice and fallow-mustard-fallow. The sowing time spread from November 21 to 29, 2022 and harvesting period spread from February 28, to March 25, 2023. There was no severe infestation of pest and diseases. Some mild infestation of mustard sawfly, mustard aphid, and Sclerotinia Rot were was observed.

Under rainfed condition, the overall performance of the demonstrated improved technologies (IP) in 193 successful demonstrations gave an average seed yield of 869 kg/ha against 544 kg/ha in FP with a yield improvement of 59.7% (Table 9). The cost of cultivation of Rs. 30397/ha in IP against the Rs. 23152/ha in FP was recorded that fetched GMR of Rs. 47361/ha in IP against the Rs. 29648/ha in FP. An ANMR of Rs. 10468 /ha was realized against the additional cost of Rs. 7245 /ha incurred due to demonstrated technology and the higher B:C ratio of IP (1.55) than that of FP (1.28) clearly indicates that demonstrated technologies in Sivasagar district was economically viable and profitable.

The variety-wise analysis under rainfed condition (Fig. 30) shows that IP demonstrations with PM-28 (49 CD) recorded highest average seed yield of 899 kg/ha against 565 kg/ha in FP with highest yield improvement of 59.1% against the additional cost of cultivation of Rs. 7360/ha, while demonstrations with DRMR-150-35 (45 CD) recorded an average seed yield of 833 kg/ha against 541kg/ha in FP with a yield improvement of 54.0%. The IP demonstrations with TS-38 (99 CD) had an average seed yield of 871 kg/ha against 534 kg/ha in FP with a yield improvement of 63.1%. The maximum ANMR (Rs. 11567/ha) fromTS-38 variety, while minimum (Rs. 7814 /ha) from DRMR-150-35 was reported. The cost of cultivation in IP ranged from Rs. 29800/ha with TS-38 to Rs. 31600/ha with DRMR-150-35, while in FP it ranged from Rs. 23000 /ha with TS-38 to Rs. 23500/ha with DRMR-150-35. All demonstrated varieties had higher B:C ratio than that of FP.



2.1.17. Performance of crop demonstrations in Sonitpur district of Assam during 2022-23

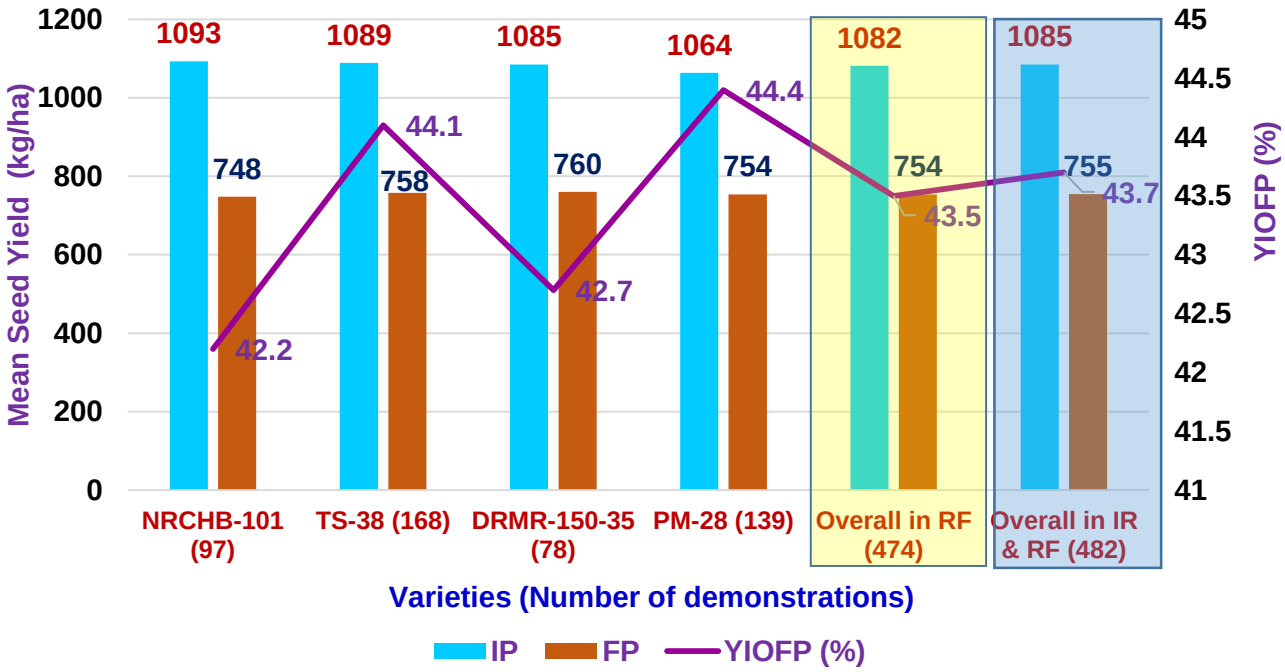
In Sonitpur, 500 crop demonstrations (CD) were conducted in 116 villages of seven clusters viz. Bihaguri (76 CD), Chaiduar (72 CD), Dhekiajuli (72 CD), Gabharu (70 CD), Balipara (70 CD), Rangapara (70 CD) and Biswanath (70 CD) with PM-28 (150 CD), NRCHB-101 (100 CD), DRMR-150-35 (80 CD) varieties of Indian mustard and TS-38 (170 CD) variety of toria under only rainfed (500 CD) conditions (Table 5 and 6). Out of 500 crop demonstrations, 18 crop demonstrations (12 of PM-28, 03 of NRCHB-101, 02 of DRMR-150-35 and–01 of TS-38) had failed because of poor germination due to moisture stress in some demonstrations. There was good growth and proper germination in other demonstrations, but drought like conditions arose in the field later on and no irrigation was applied (Table 5 and 6).

The prevailing cropping pattern was rice–mustard–pumpkin/rabi vegetables and rice- mustard-maize. The sowing time spread from November 5, 2022 to December 5, 2022 and harvesting period spread from Feb 26 to March 30, 2023. The infestation of mustard sawfly and bihar hairy caterpillar at vegetative growth and mustard aphid at flowering stage was observed.

Under rainfed condition, the overall performance of the demonstrated improved technologies (IP) in 482 demonstrations gave an average seed yield of 1085 kg/ha against 755 kg/ha in FP with a yield improvement of 43.7% (Table 9). The cost of cultivation of Rs. 28224 /ha in IP against the Rs. 21641 /ha in FP was recorded that fetched GMR of Rs. 59133/ha in IP against the Rs. 41148/ha in FP. An ANMR of Rs. 11402 /ha was realized against the additional cost of Rs. 6583/ha incurred due to demonstrated technology and the higher B:C ratio of IP (2.09) than that of FP (1.90) clearly indicates that demonstrated technologies in Sonitpur district was economically viable and profitable.

The variety-wise analysis under rainfed condition (Fig. 31) shows that IP demonstrations with NRCHB-101 (97 CD) recorded highest average seed yield of 1093 kg/ha against 748 kg/ha in FP with a yield improvement of 42.2% against the additional cost of cultivation of Rs. 6583/ha, while demonstrations with TS-38 (168 CD) recorded an average seed yield of 1089 kg/ha against 758 kg/ha in FP with a yield improvement of 44.1%. The IP demonstrations with DRMR-150-35 (78 CD) had an average seed yield of 1085 kg/ha against 760 kg/ha in FP with a yield improvement of 42.7%. The IP demonstrations with PM-28 (139 CD) had an average seed yield of 1064 kg/ha against 754 kg/ha in FP with highest yield improvement of 44.4%. The maximum ANMR (Rs. 11675 /ha) from NRCHB-101 variety, while minimum (Rs. 10676 /ha) from PM-28 was reported. The cost of cultivation in IP ranged from Rs. 28220 /ha with PM-28 to Rs. 28240 /ha with DRMR-150-35, while in FP it ranged from Rs. 21591/ha with DRMR-150-35 to Rs. 21674/ha with PM-28. All demonstrated varieties had higher B:C ratio than that of FP.

Fig 31: Performance of different varieties in Sonitpur district of Assam in rainfed situation



2.1.18. Comparison of the performance of improved varieties in different districts.

A total of 3 improved varieties of Indian mustard namely, NRCHB101, PM-28 and DRMR-150-35 of Indian mustard and one of toria namely, TS-38 were used in crop demonstrations conducted in 896 villages covering 67 clusters of fifteen districts of Assam under irrigated and rainfed condition.

Under irrigated situation, the improved variety PM-28 (Fig.32) recorded an overall average yield of 1234 kg./ha with yield improvement of 58.4% over local practice, demonstrated in 166 crop demonstrations in eight districts viz. Barpeta (9), Bongaigaon (11), Darrang (11), Kokrajhar (16), Dhubri (18), Kamrup (25), Nagaon (34) and Nalbari (42). The district wise analysis shows that PM-28 variety in IP recorded highest average yield of 1540 kg/ha with highest yield improvement of 96.7% over local (FP) practice in 9 demonstrations in Barpeta followed by average seed yield of 1514 kg/ha with a yield improvement of 86.5% in 18 demonstrations in Dhubri. The minimum average yield of 1078 kg/ha was recorded in 42 demonstrations in Nalbari.

Under rainfed situation, the improved variety PM-28 (Fig. 33) recorded an overall average yield of 1064 kg./ha with yield improvement of 49.6% over local practice, demonstrated in 1168 crop demonstrations in 15 districts viz. Nalbari (15), Sivsagar (49), Golaghat (50), Morigaon (50) Nagaon (57), Kokrajhar (53), Darrang (59), Bongaigaon (63), Dhemaji (70), Kamrup (75), Dhubri (99), Jorhat (100), Barpeta (134), Sonitpur (139) and Lakhimpur (155). The district wise analysis shows that PM-28 variety in IP recorded highest average yield of 1216 kg/ha with highest yield improvement of 91.1% over local (FP) practice in 100 demonstrations in Jorhat followed by average seed yield of 1165 kg/ha with a yield improvement of 54.5% in 70 demonstrations in Dhemaji. The minimum average yield of 899 kg/ha was recorded in 49 demonstrations in Sivsagar.

The overall average yield of PM-28 variety in both irrigated and rainfed situation was 1092 kg/ha with a yield improvement of 51.0% over local practice.

Under irrigated situation, the improved variety DRMR 150-35 (Fig.34) recorded an overall average yield of 1266 kg./ha with yield improvement of 63.8% over local practice, demonstrated in 538 crop demonstrations in seven districts viz. Barpeta (9), Bongaigaon (4), Nalbari (10), Kokrajhar (11), Nagaon (24), Dhubri (37) and Kamrup (55). The district wise analysis shows that DRMR-150-35 variety in IP recorded highest average yield of 1488 kg/ha with highest yield improvement of 97.6 % over local (FP) practice in 9 demonstrations in Barpeta followed by average seed yield of 1450 kg/ha with a yield improvement of 69.4% in 55 demonstrations in Kamrup. The minimum average yield of 1138 kg/ha was recorded in 11 demonstrations in Kokrajhar.

Under rainfed situation, the improved variety DRMR 150-35 (Fig. 35) recorded an overall average yield of 998 kg./ha with yield improvement of 72.1% over local practice, demonstrated in 902 crop demonstrations in 15 districts viz. Kamrup (24), Golaghat (30), Nalbari (30), Kokrajhar (39), Dhubri (41), Sivsagar (45), Bongaigaon (46), Morigaon (50), Jorhat (50), Nagaon (72), Sonitpur (78). Darrang (80), Dhemaji (100), Barpeta (107) and Lakhimpur (110). The district wise analysis shows that DRMR 150-35 variety in IP recorded highest average yield of Dhubri (1240) kg/ha with highest yield improvement of 79.7 % over local (FP) practice in 41 demonstrations in Dhubri followed by average seed yield of 1113 kg/ha with a yield improvement of 78.7% in 107 demonstrations in Barpeta. The minimum average yield of 756 kg/ha was recorded in 50 demonstrations in Morigaon.

The overall average yield of DRMR-150-35 variety in both irrigated and rainfed situation was 1033 kg/ha with a yield improvement of 54.2% over local practice.

Under irrigated situation, the improved variety NRCHB-101 (Fig.36) recorded an overall average yield of 1280 kg./ha with a yield improvement of 65.2% over local practice, demonstrated in 66 crop demonstrations in four districts viz. Bongaigaon (5), Kokrajhar (10) and Nagaon (19) and

Dhubri (32). The district wise analysis shows that NRCHB-101 variety in IP recorded highest average yield of 1380 kg/ha with highest yield improvement of 79.5% over local (FP) practice in 32 demonstrations in Dhubri followed by average seed yield of 1236 kg/ha with a yield improvement of 504% in 19 demonstrations in Nagaon. The minimum average yield of 1112 kg/ha was recorded in 10 demonstrations in Kokrajhar.

Under rainfed situation, the improved variety NRCHB-101 (Fig. 37) recorded an overall average yield of 1002 kg./ha with yield improvement of 49.6% over local practice, demonstrated in 471 crop demonstrations in nine districts viz. Kokrajhar (37), Bongaigaon (45), Dhubri (46), Nagaon (46), Darrang (50), Dhemaji (50), Jorhat (50), Lakhimpur (50) and Sonitpur (97). The district wise analysis shows that NRCHB 101 variety in IP recorded highest average yield of 1104 kg/ha with a yield improvement of 48.2% over local (FP) practice in 50 demonstrations in Dhemaji followed by average seed yield of 1093 kg/ha with a yield improvement of 44.19% in 97 demonstrations in Sonitpur. The minimum average yield of 774 kg/ha was recorded in 46 demonstrations in Nagaon.

The overall average yield of NRCHB-101 variety in both irrigated and rainfed situation was 1036 kg/ha with a yield improvement of 51.7% over local practice.

Under irrigated situation, the improved variety TS-38 (Fig. 38) recorded an overall average yield of 1136 kg./ha with yield improvement of 52.9 % over local practice, demonstrated in 156 crop demonstrations in six districts viz. Barpeta (31), Bongaigaon (10), Dhubri (20), Darrang (25), Kamrup (41) and Nagaon (29). The district wise analysis shows that TS-38 variety in IP recorded highest average yield of 1334 kg/ha with highest yield improvement of 89.0 % over local (FP) practice in 20 demonstrations in Dhubri followed by average seed yield of 1289 kg/ha with a yield improvement of 78.3% in 31 demonstrations in Barpeta. The minimum average yield of 968 kg/ha was recorded in 10 demonstrations in Bongaigaon.

Under rainfed situation, the improved variety TS-38 (Fig. 39) recorded an overall average yield of 970 kg./ha with yield improvement of 47.4% over local practice, demonstrated in 1811 crop demonstrations in 15 districts viz. Darrang (75), Barpeta (89), Dhubri (93), Nalbari (96), Sivsagar (99), Morigaon (100), Jorhat (100), Nagaon (102), Bongaigaon (107), Golaghat (120), Kokrajhar (120), Kamrup (177), Sonitpur (168), Dhemaji (180) and Lakhimpur (185). The district wise analysis shows that TS-38 variety in IP recorded highest average yield of 1089 kg/ha with a yield improvement of 44.4 % over local (FP) practice in 168 demonstrations in Sonitpur followed by average seed yield of 1081 kg/ha in Golaghat and Lakhimpur with a yield improvement of 58.8% in 120 demonstrations in Golaghat and 42.4% in 185 demonstrations in Lakhimpur. The minimum average yield of 854 kg/ha was recorded in 96 demonstrations in Nalbari.

The overall average yield of TS-38 variety in both irrigated and rainfed situation was 983 kg/ha with a yield improvement of 47.8% over local practice.

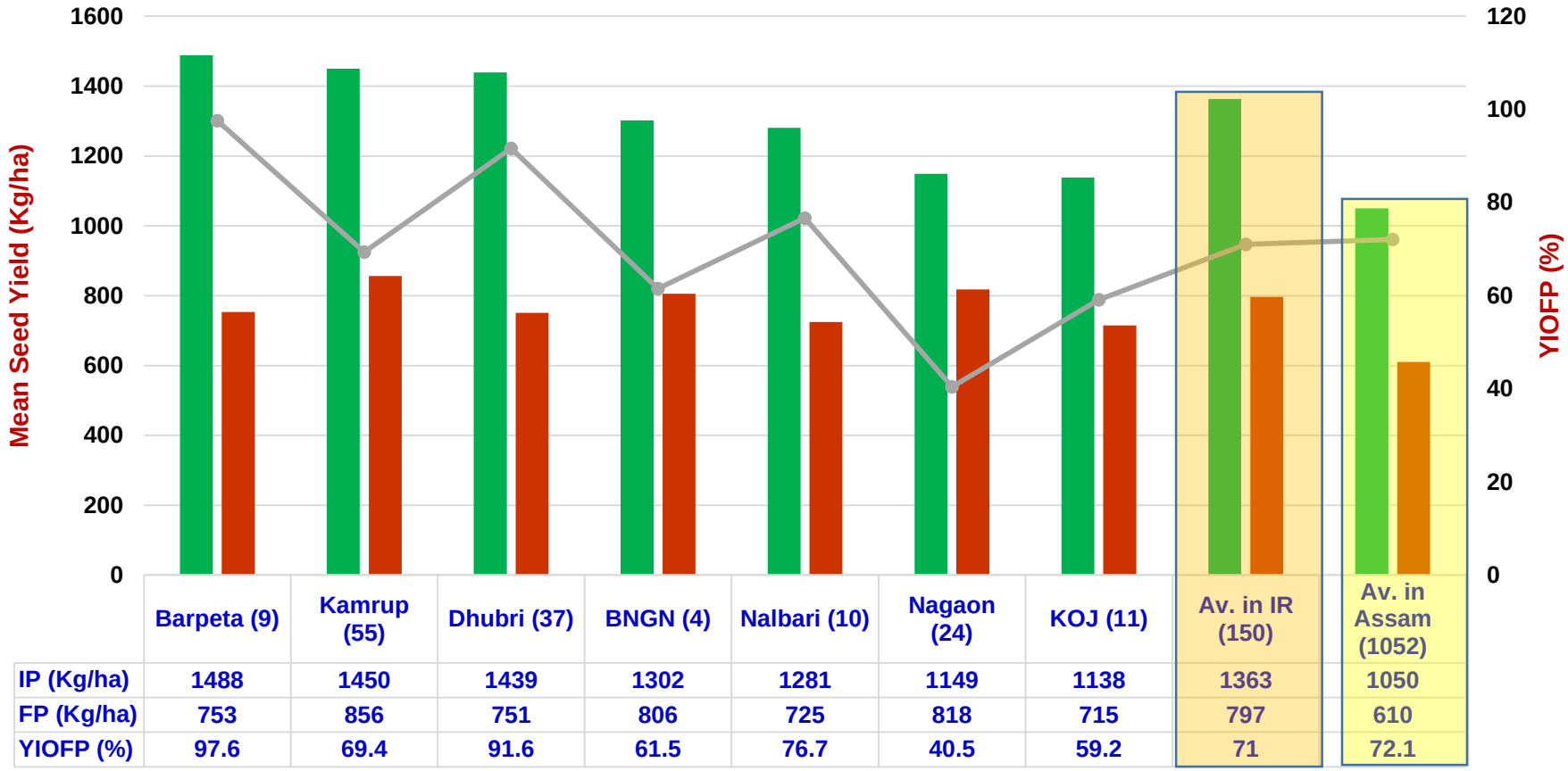
Fig. 32: District-wise average performance of PM-28 variety of Indian mustard in different districts of Assam under irrigated situation

	Barpeta (9)	Dhubri (18)	Darrang (11)	Kamrup (25)	Nagaon (34)	Bongaigaon (11)	Kokrajhar (16)	Nalbari (42)	Av. in IR (166)	Av. in Assam (1334)
IP (Kg/ha)	1540	1514	1507	1427	1330	1184	1117	1078	1234	1092
FP (Kg/ha)	783	812	852	887	864	747	720	643	779	720
YIOFP (%)	96.7	86.5	76.9	60.9	53.9	58.5	55.1	67.7	58.4	51.0

Fig. 33: District-wise average performance of PM-28 variety of Indian mustard in different districts of Assam under rainfed situation

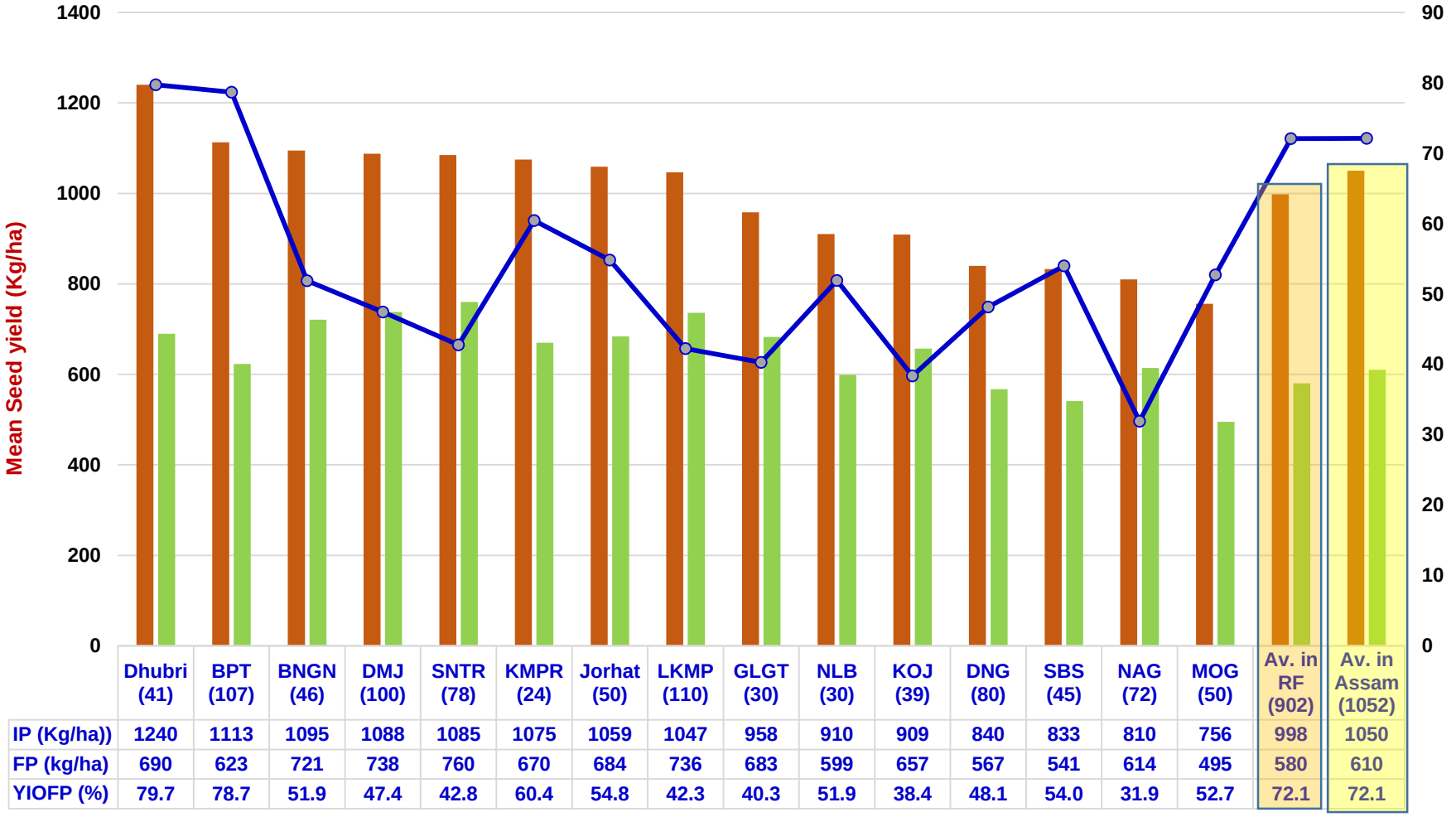
	Jorhat (100)	Dhemaji (70)	Barpeta (134)	Dhubri (99)	BNGN (63)	KMRP (75)	SNTR (139)	GLGT (50)	Darrang (59)	MOG (50)	Nalbari (15)	LKMP (155)	Nagaon (57)	KOJ (53)	SBS (49)	Av. in RF (1168)	Av. in Assam (1334)
IP (Kg/ha)	1216	1165	1122	1114	1070	1070	1064	1035	1017	1016	1014	998	979	956	899	1064	1092
FP (Kg/ha)	636	754	641	622	699	691	748	718	636	656	608	709	678	710	565	711	720
YIOFP (%)	91.1	54.5	75	79	53	54.8	42.2	44.1	59.9	54.8	66.7	40.7	44.3	34.6	59.1	49.64	51

Fig. 34: District-wise average performance of DRMR-150-35 variety of Indian mustard in different districts of Assam under irrigated situation



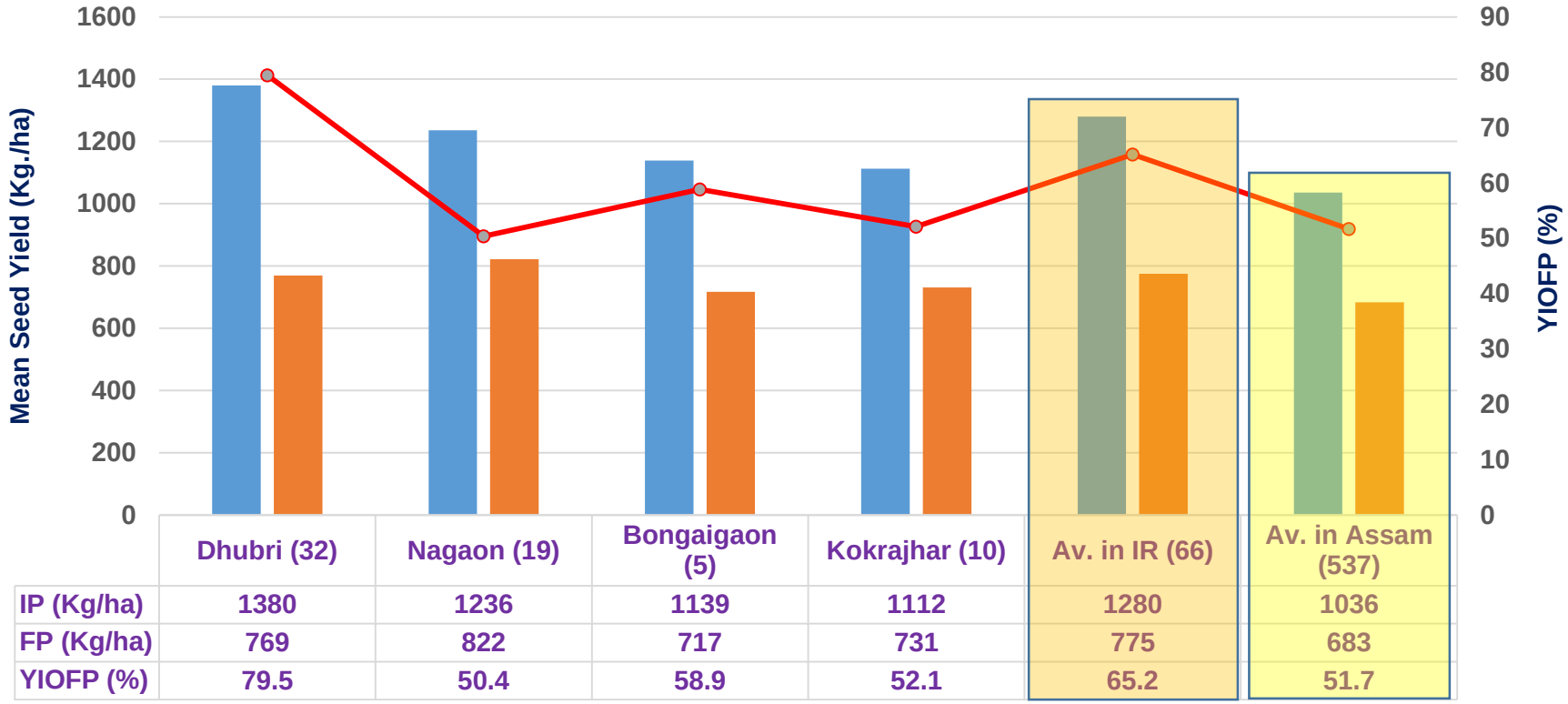
	Barpeta (9)	Kamrup (55)	Dhubri (37)	BNGN (4)	Nalbari (10)	Nagaon (24)	KOJ (11)	Av. in IR (150)	Av. in Assam (1052)
IP (Kg/ha)	1488	1450	1439	1302	1281	1149	1138	1363	1050
FP (Kg/ha)	753	856	751	806	725	818	715	797	610
YIOFP (%)	97.6	69.4	91.6	61.5	76.7	40.5	59.2	71	72.1

Fig. 35: District-wise average performance of DRMR-150-35 variety of Indian mustard in different districts of Assam under rainfed situation



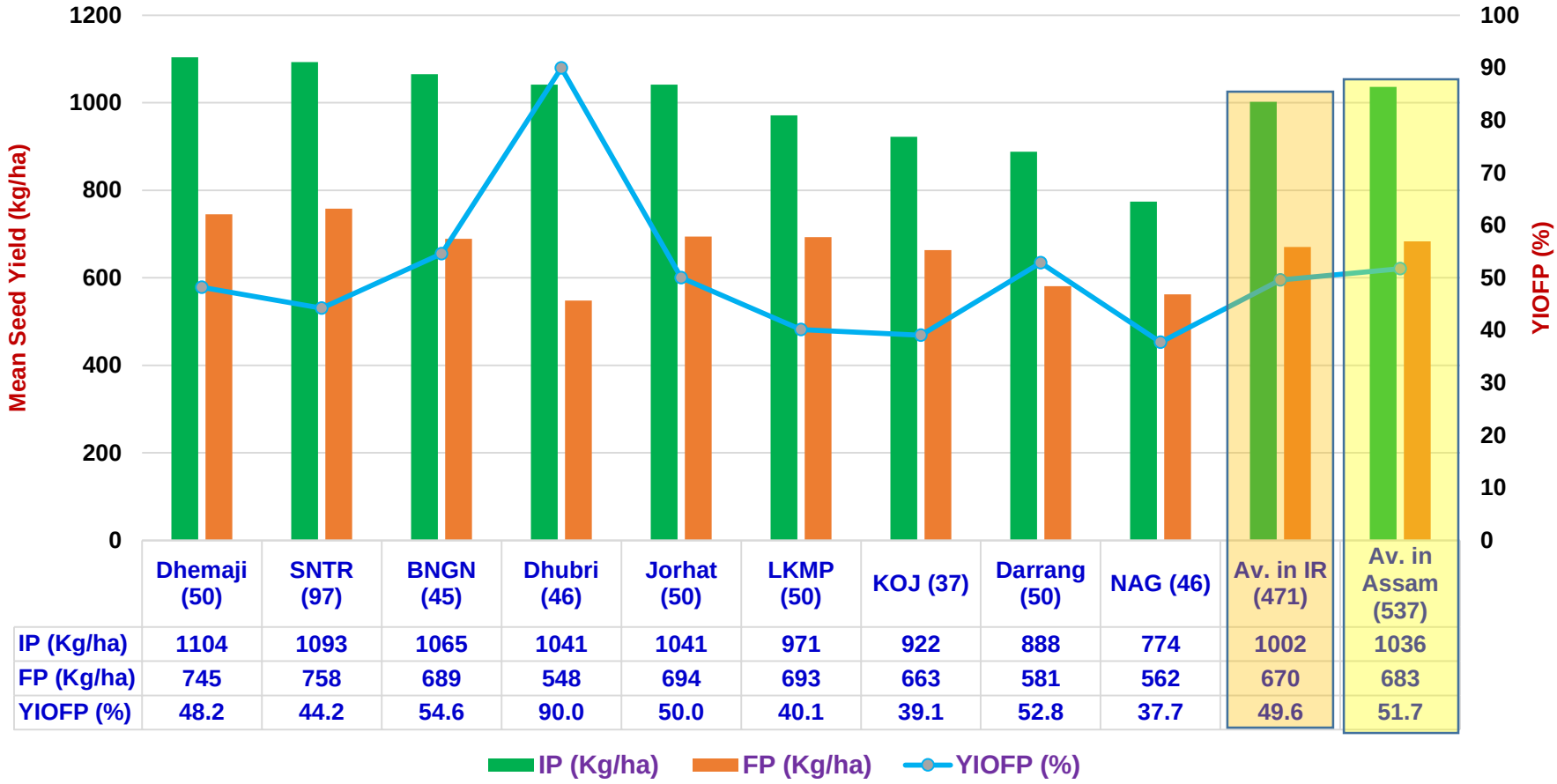
	Dhubri (41)	BPT (107)	BNGN (46)	DMJ (100)	SNTR (78)	KMPR (24)	Jorhat (50)	LKMP (110)	GLGT (30)	NLB (30)	KOJ (39)	DNG (80)	SBS (45)	NAG (72)	MOG (50)	Av. in RF (902)	Av. in Assam (1052)
IP (Kg/ha))	1240	1113	1095	1088	1085	1075	1059	1047	958	910	909	840	833	810	756	998	1050
FP (kg/ha)	690	623	721	738	760	670	684	736	683	599	657	567	541	614	495	580	610
YIOFP (%)	79.7	78.7	51.9	47.4	42.8	60.4	54.8	42.3	40.3	51.9	38.4	48.1	54.0	31.9	52.7	72.1	72.1

Fig. 36: District-wise average performance of NRCHB-101 variety of Indian mustard in different districts of Assam under irrigated situation



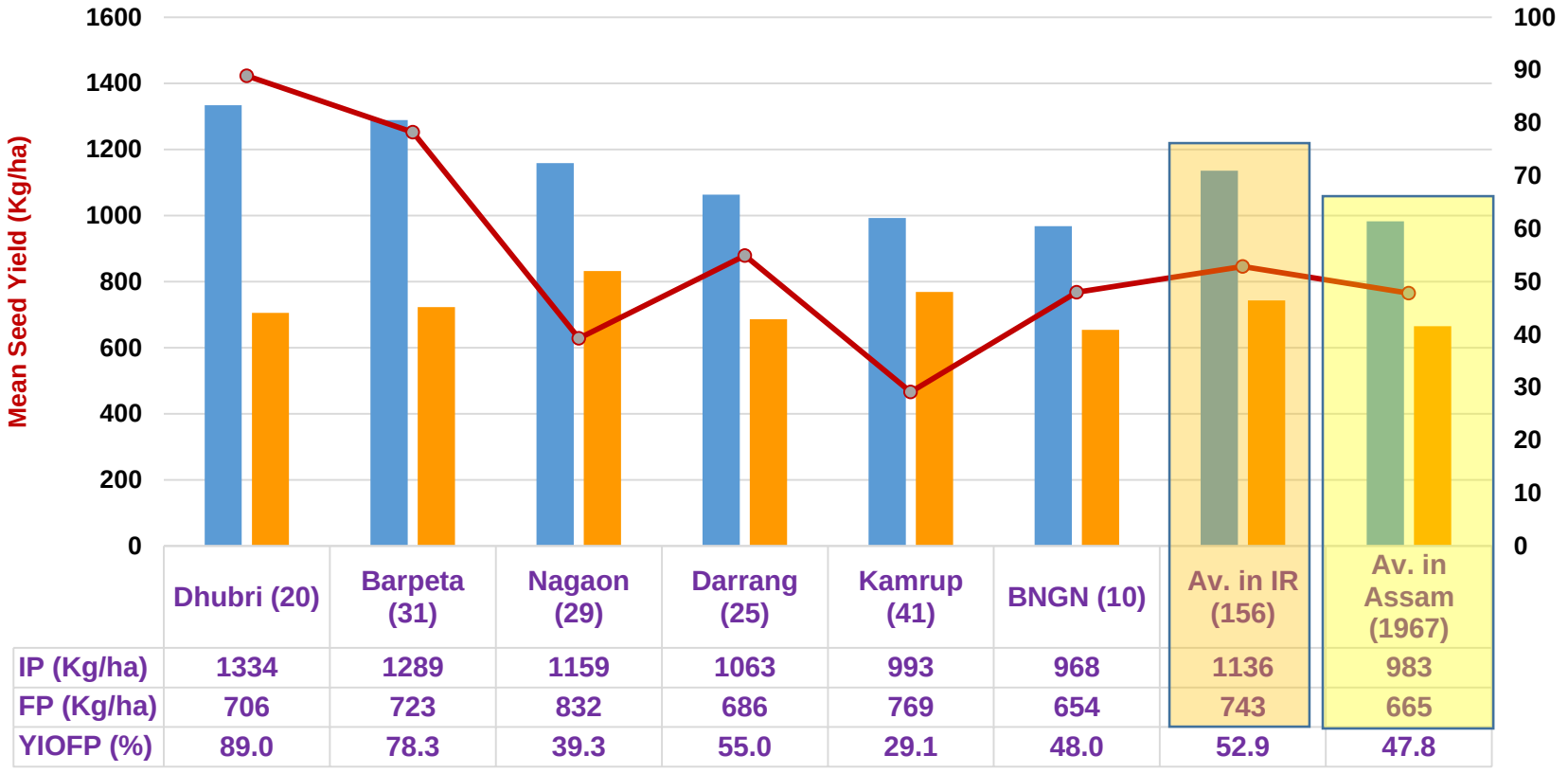
	Dhubri (32)	Nagaon (19)	Bongaigaon (5)	Kokrajhar (10)	Av. in IR (66)	Av. in Assam (537)
IP (Kg/ha)	1380	1236	1139	1112	1280	1036
FP (Kg/ha)	769	822	717	731	775	683
YIOFP (%)	79.5	50.4	58.9	52.1	65.2	51.7

Fig. 37: District-wise average performance of NRCHB-101 variety of Indian mustard in different districts of Assam under rainfed situation



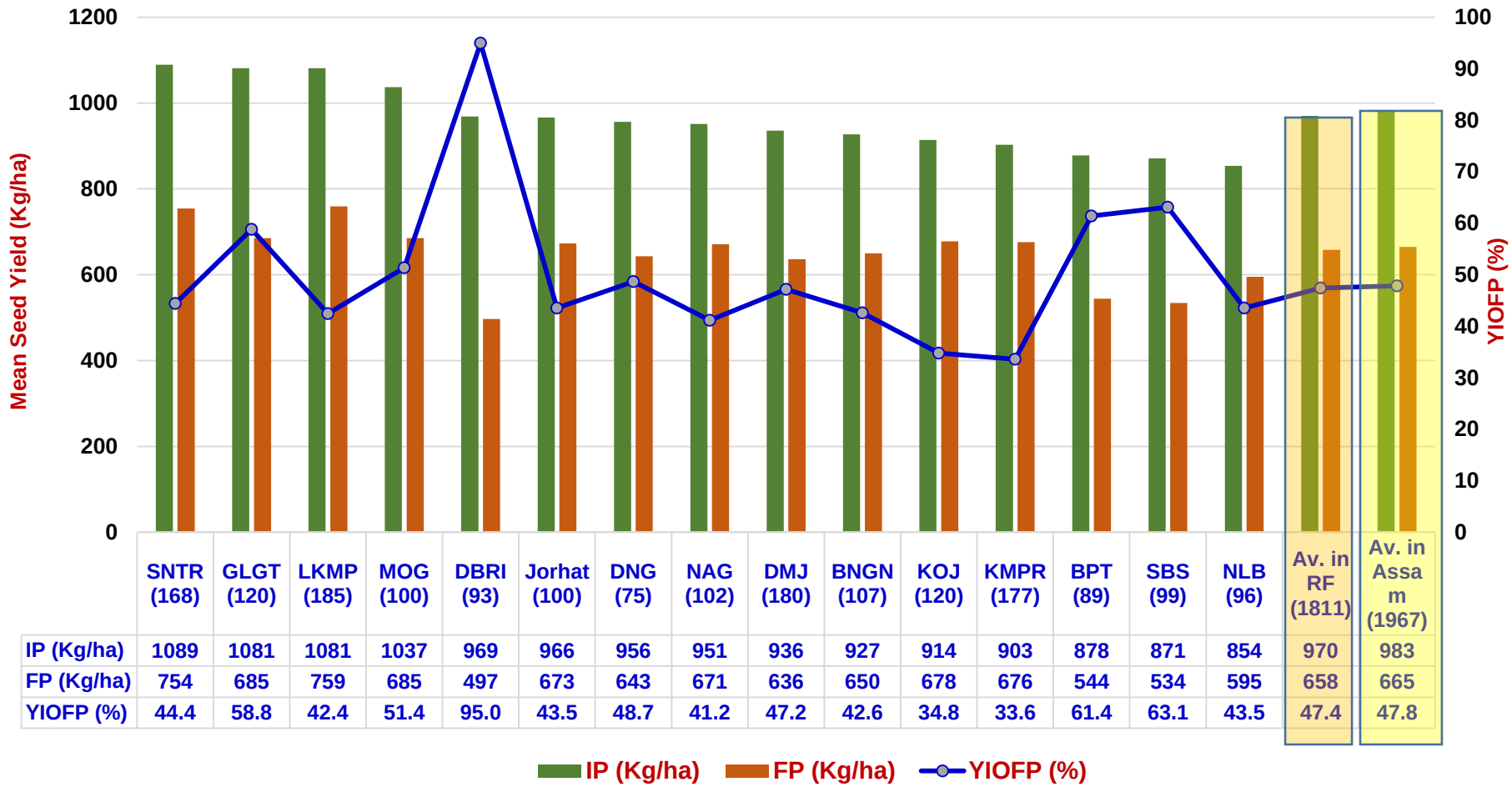
	Dhemaji (50)	SNTR (97)	BNGN (45)	Dhubri (46)	Jorhat (50)	LKMP (50)	KOJ (37)	Darrang (50)	NAG (46)	Av. in IR (471)	Av. in Assam (537)
IP (Kg/ha)	1104	1093	1065	1041	1041	971	922	888	774	1002	1036
FP (Kg/ha)	745	758	689	548	694	693	663	581	562	670	683
YIOFP (%)	48.2	44.2	54.6	90.0	50.0	40.1	39.1	52.8	37.7	49.6	51.7

Fig. 38: District-wise average performance of TS-38 variety of Indian mustard in different districts of Assam under irrigated situation



	Dhubri (20)	Barpeta (31)	Nagaon (29)	Darrang (25)	Kamrup (41)	BNGN (10)	Av. in IR (156)	Av. in Assam (1967)
IP (Kg/ha)	1334	1289	1159	1063	993	968	1136	983
FP (Kg/ha)	706	723	832	686	769	654	743	665
YIOFP (%)	89.0	78.3	39.3	55.0	29.1	48.0	52.9	47.8

Fig. 39: District-wise average performance of TS-38 variety of Indian mustard in different districts of Assam under rainfed situation



	SNTR (168)	GLGT (120)	LKMP (185)	MOG (100)	DBRI (93)	Jorhat (100)	DNG (75)	NAG (102)	DMJ (180)	BNGN (107)	KOJ (120)	KMPR (177)	BPT (89)	SBS (99)	NLB (96)	Av. in RF (1811)	Av. in Assam (1967)
IP (Kg/ha)	1089	1081	1081	1037	969	966	956	951	936	927	914	903	878	871	854	970	983
FP (Kg/ha)	754	685	759	685	497	673	643	671	636	650	678	676	544	534	595	658	665
YIOFP (%)	44.4	58.8	42.4	51.4	95.0	43.5	48.7	41.2	47.2	42.6	34.8	33.6	61.4	63.1	43.5	47.4	47.8

2.1.19. Overall performance of improved varieties in IP against the FP across the districts.

The figure 40 shows the overall average performance of improved practices (IP) including all the varieties against the farmers' practices (FP) across the fifteen districts in both viz. irrigated and rainfed situation In overall demonstrations (4890), the IP had the average seed yield of 1033 kg/ha against the 670 kg./ha (FP) with an yield improvement of 54.0% across the fifteen districts. The average cost of cultivation of Rs. 25715/ha in IP of fifteen districts against the Rs. 21192/ha in FP was recorded. An ANMR of Rs. 15261 /ha was realized against the additional cost of Rs. 4523 /ha incurred due to demonstrated technology (Fig. 41).

The figure 42 shows the overall average performance of different improved varieties in IP against the FP across the fifteen districts in both viz. irrigated and rainfed situations. Improved variety PM-28 was demonstrated in 1334 demonstrations across fifteen districts viz. Barpeta (143), Bongaigaon (74), Darrang (70), Dhemaji (70), Dhubri (117), Golaghat (50), Jorhat (100), Kamrup (100), Kokrajhar (69), Lakhimpur (155), Morigaon (50), Nagaon (91), Nalbari (57), Sivsagar (49) and Sonitpur (139). In overall demonstrations (1340), the PM-28 variety in IP recorded average yield of 1092 kg/ha with a yield improvement of 51.0% over farmers' practices (FP) across the fifteen districts.

Improved variety DRMR-150-35 was demonstrated in 1052 demonstrations across fifteen districts viz., Barpeta (116), Bongaigaon (50), Darrang (80), Dhemaji (100), Dhubri (78), Golaghat (30), Jorhat (50), Kamrup (79), Kokrajhar (50), Lakhimpur (110), Morigaon (50), Nagaon (96), Nalbari (40), Sivsagar (45) and Sonitpur (78). In overall demonstrations (1052), the DRMR-150-35 variety in IP recorded average yield of 1050 kg/ha with a yield improvement of 72.1% over local practice (FP) across the fifteen districts. (Fig. 42).

Improved variety NRCHB-101 was demonstrated in 537 demonstrations in nine districts viz., Bongaigaon (50), Darrang (50), Dhemaji (50), Dhubri (78), Jorhat (50), Kokrajhar (47), Lakhimpur (50), Nagaon (65) and Sonitpur (97). In overall demonstrations (537), the NRCHB-101 variety in IP recorded average yield of 1036 kg/ha with a yield improvement of 51.7% over local practice (FP) across the thirteen districts (Fig. 42).

The TS-38 variety of toria was demonstrated in 1967 demonstrations across fifteen districts viz. Barpeta (120), Bongaigaon (117), Darrang (100), Dhubri (180), Dhemaji (113), Golaghat (120), Jorhat (100), Kamrup (218), Kokrajhar (120), Lakhimpur (185), Morigaon (100), Nagaon (131), Nalbari (96), Sivsagar (99) and Sonitpur (168). In overall demonstrations (1967), the TS-38 variety in IP recorded average yield of 983 kg/ha with a yield improvement of 47.8 % over local practice (FP) across the fifteen districts (Fig. 42).

The overall performance of different varieties under irrigated situation (Fig. 43) shows that IP demonstrations with DRMR-150-35 (150 CD) recorded highest average seed yield of 1367 kg/ha against 797 kg/ha in FP with highest yield improvement of 71.0%, while demonstrations with NRCHB-101 (66 CD) had an average seed yield of 1280 kg/ha against 775 kg/ha in FP with a yield improvement of 65.2%. The IP demonstrations with PM-28 (166 CD) had an average seed yield of 1234 kg/ha against 779 kg/ha in FP with a yield improvement of 58.4%. The IP demonstrations with TS-38 (156 CD) recored an average seed yield of 1136 kg/ha against 743 kg/ha in FP with a yield improvement of 52.9%.

. The overall performance of different varieties under rainfed situation (Fig. 44) shows that IP demonstrations with PM-28 (1168 CD) recorded highest average seed yield of 1064 kg/ha against 711kg/ha in FP with a yield improvement of 49.6%, while demonstrations with NRCHB-101 (471 CD) had an average seed yield of 1002 kg/ha against 670 kg/ha in FP with a yield improvement of 49.6%. The IP demonstrations with DRMR-150-35 (902 CD) had an average seed yield of 998 kg/ha against 580 kg/ha in FP with highest yield improvement of 72.1%. The IP demonstrations with TS-38 (1811 CD) recored an average seed yield of 970 kg/ha against 658 kg/ha in FP with a yield improvement of 47.4%.

Fig. 40: Overall average performance of IP demonstrations against FP across fifteen districts of Assam

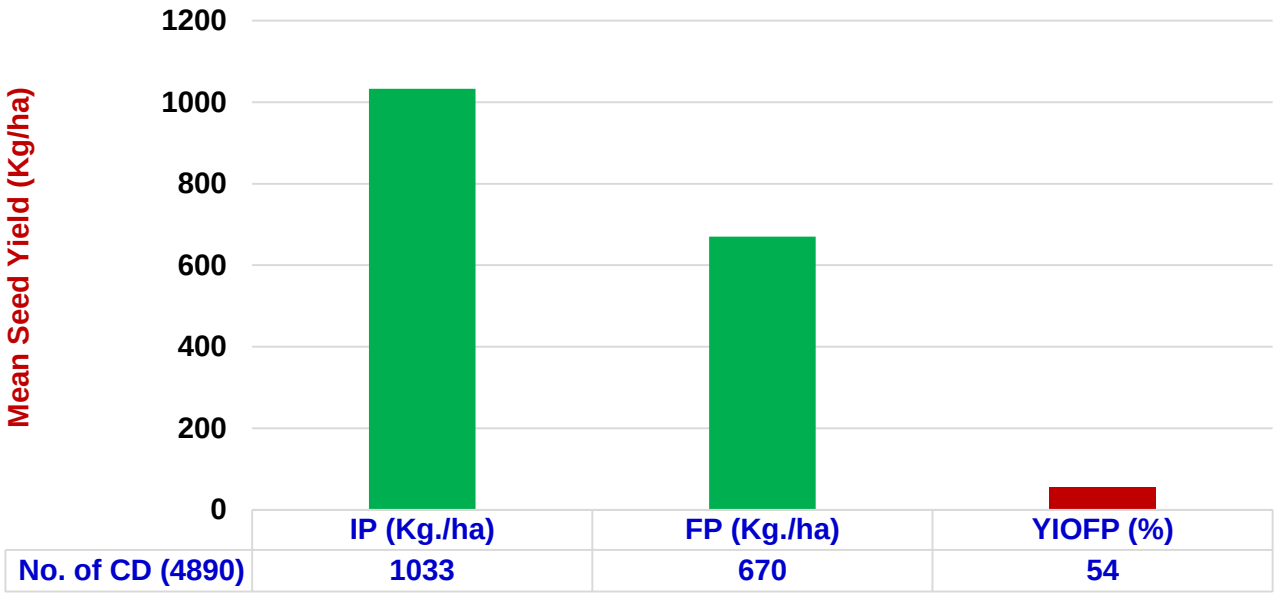


Fig. 41: Overall CoC and ANMR across the fifteen districts of Assam

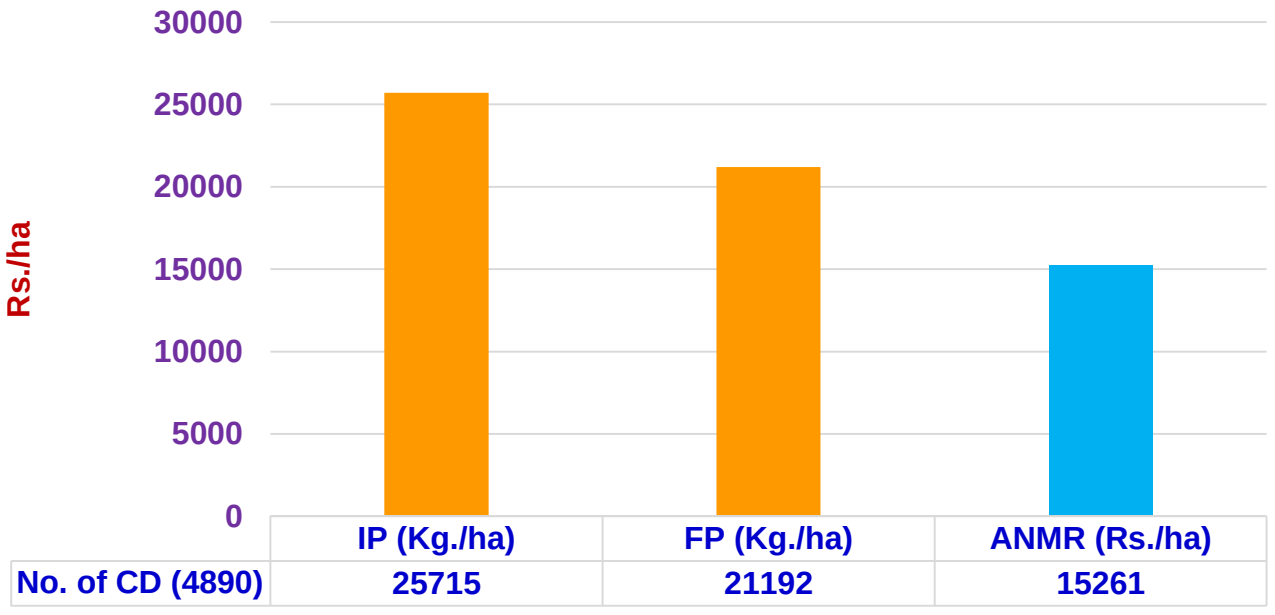
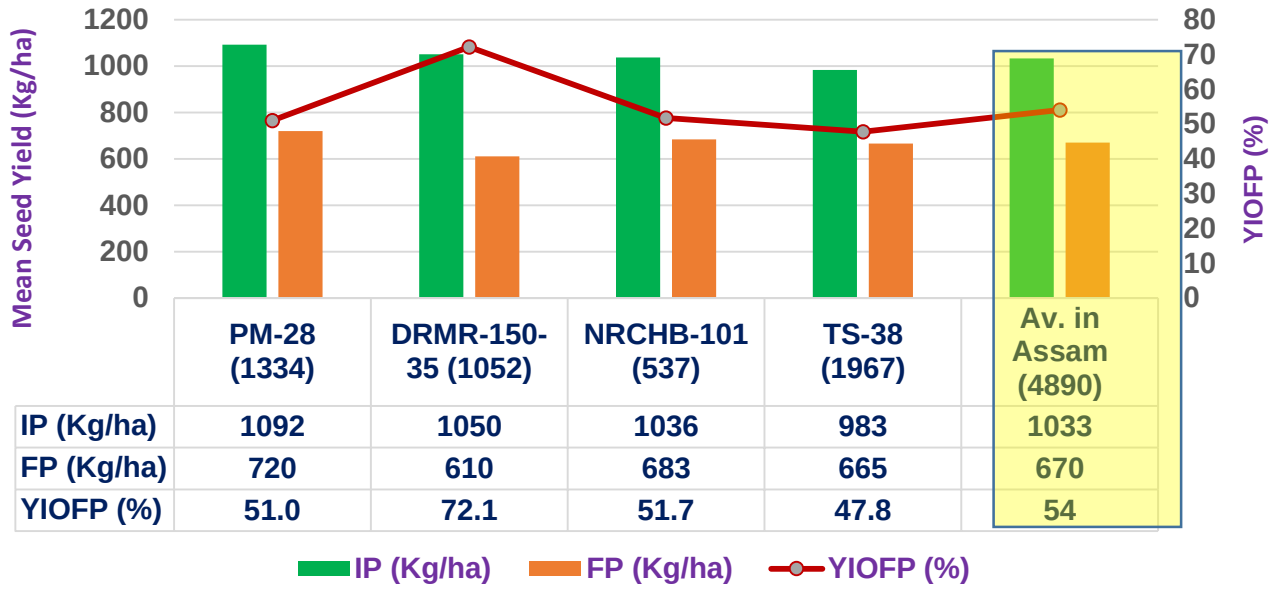
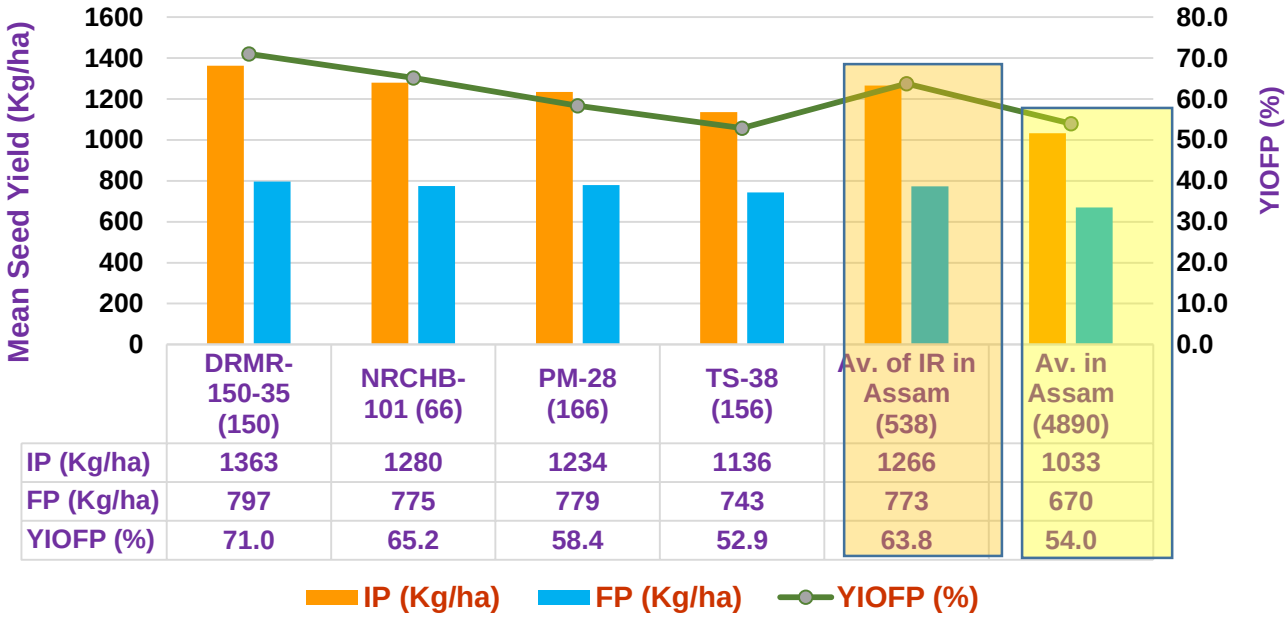


Fig. 42: Overall average performance of different varieties in both situations across the fifteen districts of Assam



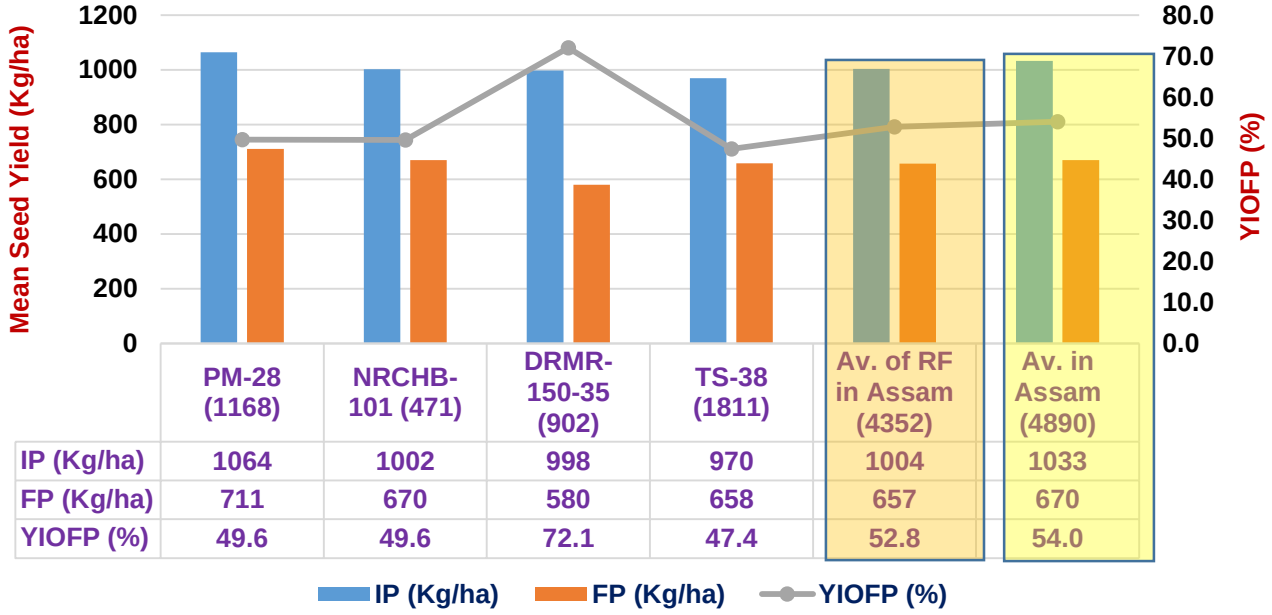
	PM-28 (1334)	DRMR-150-35 (1052)	NRCHB-101 (537)	TS-38 (1967)	Av. in Assam (4890)
IP (Kg/ha)	1092	1050	1036	983	1033
FP (Kg/ha)	720	610	683	665	670
YIOFP (%)	51.0	72.1	51.7	47.8	54

Fig. 43: Overall average performance of different varieties in irrigated situation across the fifteen districts of Assam



	DRMR-150-35 (150)	NRCHB-101 (66)	PM-28 (166)	TS-38 (156)	Av. of IR in Assam (538)	Av. in Assam (4890)
IP (Kg/ha)	1363	1280	1234	1136	1266	1033
FP (Kg/ha)	797	775	779	743	773	670
YIOFP (%)	71.0	65.2	58.4	52.9	63.8	54.0

Fig. 44: Overall average performance of different varieties in rainfed situation across the fifteen districts of Assam



	PM-28 (1168)	NRCHB-101 (471)	DRMR-150-35 (902)	TS-38 (1811)	Av. of RF in Assam (4352)	Av. in Assam (4890)
IP (Kg/ha)	1064	1002	998	970	1004	1033
FP (Kg/ha)	711	670	580	658	657	670
YIOFP (%)	49.6	49.6	72.1	47.4	52.8	54.0

Glimpses of monitoring of Crop Demonostration by expert during 2022-23 under ICAR-DRMR-OPIU (Agri)-APART Project

Morigaon

Morigaon

Nalbari

Nalbari

Kamrup

Bongaigaon

Glimpses of monitoring of Crop Demonostration by expert during 2022-23 under ICAR-DRMR-OPIU (Agri)-APART Project

Kamrup

Sonitpur

Nagaon

Nagaon

Lakhimpur

Kamrup

2.2 Field days organized during 2022-23

Field day is one of the group extension teaching methods used in extension services in order to disseminate information and stimulate adoption of improved agriculture technology by farmers. Field day is a method of motivating the farmers to adopt a new practice by showing what has actually been achieved by applying the practice under field condition. Field days are arranged to demonstrate new technologies in front of a large manageable group of interested farmers. Through this activity farm experts, extension workers and farmers are involved and learn from each other. The field days found to contribute in promoting the adoption of improved agricultural technologies. Farmers get the opportunity to see the performance of demonstrated new varieties and technologies in real field situation and learn new information about the demonstrated technology components. Keeping in view the importance of field days, 250 field days (5 per cent of 5000 demonstrations) were organized during the period.

A total of 250 field days were organized in 58 clusters of 15 selected districts at maturity stage during February-March 2023 at the demonstrated fields of selected farmers under the project. The extension officers, ATM, BTM, Research Associates and farmers of the villages participated in these field days. Farmers got the opportunity to see the impact of new mustard varieties and technologies in real field situation and learnt about the applicability of the demonstrated mustard technologies/ practices in their own situation. They were motivated to adopt the improved mustard technologies and practices by showing its performance and profitability under field conditions. These helped in removing the doubts, superstitions and unfavourable attitude of the farmers about the scientific technologies of mustard cultivation. Interaction of farmers with extension personnel helped them in understand the importance of proper land preparation, timely sowing, selection of suitable varieties, proper sowing method, spacing, inter-culture operations, insect- disease management and proper harvesting of rapeseed- mustard crop. A total of 7009 farmers and farm women participated in these 250 field days. The summary and detail information of field days are presented in table 12 and table 13, respectively.

Table 10: Summary of Field days organized during 2022-23.

SN	Activity	Target (No.)	Achieved (No.)	Beneficiaries (No.)	Beneficiaries (No.)						
					Gender		Social Category				Total
1	Field day	250	250	7009	Male	Female	Gen	OBC	SC	ST	7009
					4543	2466	2795	2109	786	1319	

Table 11: Details of field Day organised during 2022-23

SN	District	No. of Field day	Name of Cluster	Place/Village	Date	Beneficiaries (No.)	Beneficiaries (No.)						
							Gender		Social Category				
							Male	Female	GEN	OBC	SC	ST	Total
1.	Barpeta	1	Gumafulbari	Damaljar	17.02.2023	30	16	14	30	0	0	0	30
		2		Bishanpur	18.02.2023	30	11	19	30	0	0	0	30
		3		Borshua	20.02.2023	30	19	11	30	0	0	0	30
		4	Bajali	Dharmapur	20.02.2023	50	24	26	16	2	32	0	50
		5		Barnalikjchi	13.03.2023	30	12	18	10	4	16	0	30
		6	Barpeta	Bhella	24.02.2023	30	3	27	30	0	0	0	30
		7		Bheraldi	25.02.2023	30	18	12	30	0	0	0	30
		8		Fatikgrah	06.03.2023	30	21	9	30	0	0	0	30
		9	Bhawanipur	Kuchiajhar	23.02.2023	50	41	9	14	0	4	32	50
		10		Karagari	27.02.2023	50	38	12	50	0	0	0	50
		11	Chenga	Haripur	02.03.2023	50	37	13	45	3	2	0	50
		12		Batgaon	03.03.2023	46	26	20	9	3	34	0	46
		13	Chakchaka	Chengulia	04.03.2023	30	22	8	30	0	0	0	30
		14		Bhaluki	04.03.2023	30	14	16	30	0	0	0	30
		15	Pakabethbari	Kayakuchigaon	08.03.2023	30	13	17	30	0	0	0	30
		16		Barbala	09.03.2023	30	20	10	30	0	0	0	30
		17	Rupshi	Haldiagaon	06.03.2023	50	33	17	50	0	0	0	50
		18	Sarukhetri	Lachima	16.03.2023	30	9	21	30	0	0	0	30
		19		Belbari Pathar	17.02.2023	30	26	4	30	0	0	0	30
		20	Mandia	Jadabpur	02.03.2023	30	18	12	30	0	0	0	30

SN	District	No. of Field day	Name of Cluster	Place/Village	Date	Beneficiaries (No.)	Beneficiaries (No.)						
							Gender		Social Category				
							Male	Female	GEN	OBC	SC	ST	Total
	Bongaigaon	1	Manikpur	Barbila	14.02.2023	30	24	6	16	14	0	0	30
		2		Dompara	15.02.2023	32	31	1	2	28	2	0	32
		3		Bashbari No.1	01.03.2023	36	23	13	36	0	0	0	36
		4		Aolaguri	01.03.2023	32	19	13	32	0	0	0	32
		5		Adlaguri	11.03.2023	31	22	9	0	31	0	0	31
		6	Patiladoha	Nowapara	08.03.2023	30	18	12	0	29	1	0	30
		7		Bhatipara	08.03.2023	30	29	1	23	7	0	0	30
		8		Bridhabasi	09.03.2023	30	18	12	0	9	21	0	30
		9		Garugaon	09.03.2023	30	21	9	0	30	0	0	30
		10		Patiladoha	11.03.2023	30	30	0	0	30	0	0	30
		11	Bidyapur	Hollaguri	25.03.2023	33	27	6	5	28	0	0	33
		12		Hollaguri	26.03.2023	31	28	3	4	27	0	0	31
		13		Nachankuti	10.03.2023	35	25	10	1	34	0	0	35
		14		Nachankuti	10.03.2023	32	28	4	0	32	0	0	32
		15		Chikibiki	12.03.2023	31	26	5	0	31	0	0	31
3	Darrang	1	Bechimari	Kahibari	14.02.2023	30	26	4	25	0	5	0	30
		2		Kahibari	16.02.2023	30	22	8	17	2	11	0	30
		3		Chokabahi	16.02.2023	30	22	8	16	0	14	0	30
		4		Dalgaon	18.02.2023	30	28	2	30	0	0	0	30
		5		No.1 Borgurakhuti	18.02.2023	30	30	0	30	0	0	0	30
		6	Sipajhar	Gharwa Sonapur	01.03.2023	30	17	13	11	19	0	0	30
		7		Singimari	03.03.2023	30	14	16	1	29	0	0	30
		8		Badiashisha	04.03.2023	30	24	6	0	26	4	0	30

		9		Kanoi Pathar	06.03.2023	30	12	18	0	23	7	0	30
		10		Maijali	13.03.2023	30	14	16	11	19	0	0	30
		11	Pachim Mangaldoi	Barthekerabari	23.02.2023	30	28	2	6	8	13	3	30
		12		Choto Nagaon	23.02.2023	30	28	2	30	0	0	0	30
		13		Bezpara	25.02.2023	30	23	7	25	2	0	3	30
		14		P. Mangaldoi	25.02.2023	30	30	0	2	24	4	0	30
		15		Barthekerabari	05.03.2023	30	28	2	30	0	0	0	30
4	Dhemaji	1	Sissiborgaon	Amguri Bali	16.02.2023	30	13	17	0	0	0	30	30
		2		Amguri Bali	18.02.2023	30	14	16	0	0	0	30	30
		3		Muktiar	19.02.2023	30	16	14	0	0	0	30	30
		4		Taranipathar	03.01.2023	30	6	24	0	30	0	0	30
		5		Sinigibeel	03.02.2023	30	17	13	0	0	0	30	30
		6		Muktiar	03.03.2023	30	13	17	0	0	0	30	30
		7	Bordoloni	Padumoni	03.01.2023	30	16	14	7	10	0	13	30
		8		Khana	03.02.2023	30	16	14	0	30	0	0	30
		9		Bahkatika	03.03.2023	30	25	5	0	30	0	0	30
		10		Majgaon	03.04.2023	30	20	10	0	30	0	0	30
		11		Boruahpathar	03.05.2023	30	16	14	15	6	5	4	30
		12	MSTD	Purana Jelom	17.02.2023	30	26	4	0	0	0	30	30
		13		Lamajan Mising	18.02.2023	30	15	15	0	4	7	19	30
		14		Majgaon	23.02.2023	30	26	4	0	0	0	30	30
		15		Nawkata	13.03.2023	30	16	14	0	0	0	30	30
		16		Magurmari	14.03.2023	29	20	9	0	0	0	29	29
		17	Machkhowa	Pahtia No.1	18.02.2023	30	17	13	0	5	0	25	30
		18		Rajabari	21.02.2023	30	18	12	0	0	30	0	30
		19		Phatia	22.02.2023	30	18	12	0	0	0	30	30
		20		Bengenagarah	03.01.2023	30	24	6	0	0	0	30	30

5	Dhubri	1	Mahamaya	Patakata-PT-II	04.02.2023	36	24	12	36	0	0	0	36
		2		Patakata-PT-I	06.02.2023	45	27	18	45	0	0	0	45
		3		Jhelturchar	07.02.2023	32	20	12	32	0	0	0	32
		4		Patakata-PT-I	26.02.2023	23	15	8	23	0	0	0	23
		5	Agomani	Kaimari-PT-II	05.02.2023	31	18	13	31	0	0	0	31
		6		Kharbari-PT-I	23.02.2023	36	20	16	36	0	0	0	36
		7		Kaimari-PT-V	25.02.2023	30	19	11	30	0	0	0	30
		8		Digholtari	28.02.2023	33	19	14	26	7	0	0	33
		9	Chapar-Salkocha	Fauzdarchar	04.02.2023	31	19	12	31	0	0	0	31
		10		Simlabari	13.02.2023	28	15	13	28	0	0	0	28
		11		Fauzdarchar	15.02.2023	29	18	11	29	0	0	0	29
		12		Simlabari	19.02.2023	25	18	7	25	0	0	0	25
		13	Rupshi	Sukhatikhata	29.03.2023	35	20	15	22	13	0	0	35
		14		East Gaikhowa PT-1	22.02.2023	34	22	12	20	14	0	0	34
		15		Palpara LP School	15.03.2023	33	16	17	33	0	0	0	33
		16		Sukhatikhata	10.03.2023	31	17	14	31	0	0	0	31
		17	Gauripur	Tisterpar	05.03.2023	26	14	12	21	5	0	0	26
		18		Dubirpar	07.03.2023	35	25	10	35	0	0	0	35
		19		Kismat Hasdaha	11.03.2023	38	18	20	38	0	0	0	38
		20		Madhusoulmari -Part-I	10.03.2023	27	13	14	27	0	0	0	27
6	Golaghat	1	Bokakhat	Nachonipar	13.02.2023	25	20	5	6	0	3	16	25
		2		Upar Temera	13.02.2023	30	24	6	10	2	5	13	30
		3		Missimiati	14.02.2023	32	29	3	5	3	0	24	32
		4		Alami Ragdia	14.02.2023	30	30	0	5	0	0	25	30

		5		Charoh Missing	19.02.2023	24	20	4	3	1	6	14	24
		6		Gulung Doytal	19.02.2023	31	23	8	6	3	12	10	31
		7	Morangi	Thuramukh likson	15.02.2023	30	24	6	1	29	0	0	30
		8		Bebejia	09.03.2023	31	18	13	0	27	4	0	31
		9	Sarupathar	1 No. Podumoni	16.03.2023	27	25	2	10	5	6	6	27
		10		Moran Gaon	17.03.2023	29	24	5	3	20	6	0	29
7	Jorhat & Majuli	1	Ujani Majuli	Borpomuah	31.01.2023	18	13	5	1	0	0	17	18
		2		Borpomuah	08.02.2023	32	27	5	0	0	0	32	32
		3		Nayabazar	23.03.2023	20	13	7	11	8	0	1	20
		4		Namoni Serepai	10.03.2023	18	14	4	0	0	0	18	18
		5	Majuli	Adielengi	13.02.2023	23	15	8	17	4	2	0	23
		6		Mohorichuk	07.03.2023	28	24	4	0	0	13	15	28
		7		Bormukoli	08.03.2023	28	25	3	0	0	3	25	28
		8		Notun Bokora	09.03.2023	22	16	6	8	6	2	6	22
		9	Kaliapani	Ghurasorapothar	21.02.2023	29	18	11	20	9	0	0	29
		10		Ghurasorapothar	22.02.2023	25	17	8	25	0	0	0	25
		11		Jopong Gaon	25.02.2023	25	12	13	0	0	0	25	25
		12		Da Gowal Gaon	17.02.2023	28	8	20	27	1	0	0	28
		13		Azarguri	15.03.2023	18	12	6	2	15	1	0	18
		14	Dhekorgorah	Chinaichuk	19.02.2023	22	16	6	0	2	5	15	22
		15		Chinaichuk	26.02.2023	21	17	4	0	2	2	17	21
8	Kamrup	1	Kamalpur	Baruajani	14.02.2023	30	24	6	14	10	6	0	30
		2		Dwigunpar	14.02.2023	25	18	7	12	8	3	2	25
		3		Baruajani	15.02.2023	28	15	13	20	5	3	0	28

		4	Bihdia jajikona	Loch	07.02.2023	32	18	14	20	6	6	0	32
		5		Mundapur	08.02.2023	35	26	9	20	11	0	4	35
		6		Sahan	21.02.2023	22	15	7	12	3	7	0	22
		7		Pubpar jatiobhangara	22.02.2023	20	12	8	8	5	5	2	20
		8		Singarapara	00/01/1900	27	18	9	21	6	0	0	27
		9		Ganakjhar	12.03.2023	24	10	14	20	4	0	0	24
		10		Muktapur	14.03.2023	20	15	5	13	7	0	0	20
		11		Bihdia	16.03.2023	34	24	10	22	5	4	3	34
		12		Loch	17.03.2023	35	21	14	25	9	0	1	35
		13	Sualkuchi	Kismat bongshor	10.02.2023	26	18	8	15	6	5	0	26
		14		Khanamukh	12.02.2023	22	15	7	12	10	0	0	22
		15		Bongshor	16.02.2023	28	20	8	15	13	0	0	28
		16		Abhoypuriapam	17.02.2023	30	27	3	14	12	4	0	30
		17	Hajo	Halogaon	11.02.2023	35	19	16	18	12	2	3	35
		18		Tokratia	03.03.2023	25	23	2	15	8	2	0	25
		19		Bamundi	05.03.2023	20	14	6	12	4	4	0	20
		20	Chandrapur	Ghoramarjanpam	09.02.2023	22	14	8	4	0	18	0	22
9	Kokrajhar	1	Dotma	Bhutiyapara	14.02.23	25	15	10	0	0	0	25	25
		2	Dotma	Bhutiyapara 2	15.02.23	24	19	5	0	0	0	24	24
		3	Dotma	Katribari	27.02.23	20	12	8	0	0	0	20	20
		4	Dotma	Hogmabill	27.02.23	28	19	9	0	0	0	28	28
		5	Dotma	Simlaguri	10.03.23	22	15	7	0	0	0	22	22
		6	Dotma	Thuribari	11.03.23	22	14	8	0	0	0	22	22

		7	Kokrajhar	Uttar Debragaon	21.02.23	21	15	6	0	21	0	0	21
		8	Kokrajhar	Brahmapur	21.02.23	23	18	5	0	23	0	0	23
		9	Kokrajhar	Garokhuta	15.03.23	25	22	3	20	5	0	0	25
		10	Kokrajhar	Nayachara pt 3	16.03.23	23	17	6	0	23	0	0	23
		11	Kachugaon	Boshgaon	22.02.23	24	20	4	0	3	0	21	24
		12	Kachugaon	Majoti	22.02.23	22	20	2	0	0	0	22	22
		13	Kachugaon	Narayanpur	23.02.23	25	21	4	0	5	20	0	25
		14	Kachugaon	Khagribari	23.02.23	23	18	5	0	0	0	23	23
		15	Kachugaon	Gokulkata	24.02.23	24	18	6	0	0	0	24	24
10	Lakhimpur	1	Dhakuakhana	Gharmara	28.02.2023	23	6	17	0	20	3	0	23
		2		1 no bantow	21.02.2023	25	22	3	0	15	10	0	25
		3		Dighala gaon	23.02.2023	22	2	20	2	15	5	0	22
		4		Jamuguri	08.03.2023	28	10	18	8	10	8	2	28
		5		Jiamoria	11.03.2023	31	20	11	0	0	25	6	31
		6		Dhenukhana	11.03.2023	23	3	20	3	10	10	0	23
		7	Ghilamara	Bhakat gaon	22.03.2023	25	15	10	0	24	0	1	25
		8		Phulbari	26.02.2023	28	8	20	10	18	0	0	28
		9		Sonari chapori	26.02.2023	21	15	6	0	21	0	0	21
		10		Kekuri	12.03.2023	24	20	4	0	3	21	0	24
		11		Dakhin gaon	13.03.2023	22	10	12	1	21	0	0	22
		12	Narayanpur	Pathali pahar	04.03.2023	30	22	8	20	10	0	0	30
		13		1 no bahupathar	09.03.2023	18	9	9	0	4	14	0	18
		14		Tintia	10.03.2023	22	2	20	0	22	0	0	22
		15		Madhavpur	10.03.2023	24	17	7	8	9	2	5	24
		16	Telahi	Khaga	24.02.2023	23	3	20	0	0	23	0	23
		17		Pamua khabolu	27.02.2023	30	22	8	0	0	30	0	30
		18		Salmara	02.03.2023	25	10	15	0	0	22	3	25
		19	Lakhimpur	Amguri	06.03.2023	15	10	5	15	0	0	0	15

		20		Korson	06.03.2023	18	10	8	10	8	0	0	18
		21		Major guri	07.03.2023	22	12	10	15	7	0	0	22
		22	Bihpuria	Kolabil mornoi	01.03.2023	26	19	7	4	19	1	2	26
		23		Lagasu gaon	5.32023	17	13	4	0	0	17	0	17
		24	Karunabari	sandohkhowa	25.02.2023	25	15	10	25	0	0	0	25
		25		Sandohkhowa chapori	03.03.2023	17	7	10	13	4	0	0	17
11	Morigaon	1	Bhurbandha	Bakhorbori	06.02.2023	19	11	8	19	0	0	0	19
		2		Habibaranggabari	08.02.2023	30	20	10	15	10	5	0	30
		3		Garmari	16.02.2023	18	10	8	0	9	9	0	18
		4		Haldhibari	28.02.2023	16	4	12	16	0	0	0	16
		5		Bhurbandha	08.03.2023	20	9	11		8	0	12	20
		6	Mayong	Bardalpathar	03.02.2023	20	9	11	7	13	0	0	20
		7		Garakhiadhap	04.02.2023	16	10	6	5	0	11	0	16
		8		Botabori	07.02.2023	13	7	6	5	8	0	0	13
		9		Daborghat	02.03.2023	13	5	8	4	0	9	0	13
		10	Kapili	Luchonabori	01.03.2023	20	9	11	0	0	0	20	20
12	Nagaon	1	Kaliabor	Keribakori	09.02.2023	33	21	12	5	25	0	3	33
		2		Naltoli	15.02.2023	25	20	5	2	3	20	0	25
		3		Akhiranga	15.02.2023	20	12	8	4	16	0	0	20
		4		Dulal Madhab	25.02.2023	22	20	2	10	5	3	4	22
		5		Sapori	25.02.2023	28	28	0	7	0	0	21	28
		6	Khagorijan	Kachamari	14.02.2023	35	20	15	1	33	0	1	35
		7		Senchowa	24.02.2023	30	27	3	11	5	14	0	30
		8		Chotarupahi	19.02.2023	35	12	23	35	0	0	0	35
		9	Batadraba	Khariamari	26.02.2023	30	20	10	30	0	0	0	30
		10		Bilotia	23.02.2023	35	24	11	35	0	0	0	35

		11		Balisatra	23.02.2023	30	30	0	30	0	0	0	30
		12	Pachim Kaliabor	Borghuli	16.02.2023	30	17	13	8	19	3	0	30
		13		Namgaon	16.02.2023	31	21	10	10	16	4	1	31
		14		Haluwagaon	22.02.2023	35	16	19	30	2	2	1	35
		15		Baraligaon	22.02.2023	32	25	7	5	11	16	0	32
		16	Raha	Bogoriguri	20.02.2023	25	10	15	2	8	1	14	25
		17		Dighaldari	20.02.2023	20	0	20	0	20	0	0	20
		18		Konwariati	21.02.2023	20	14	6	2	18	0	0	20
		19		Guimari	21.02.2023	20	12	8	0	0	0	20	20
		20		Mudoigaon	24.02.2023	20	0	20	0	20	0	0	20
13	Nalbari	1	Borigog-Banbhag	Balitara	11.02.2023	30	8	22	15	10	5	0	30
		2		Mohina-I	04.03.2023	30	2	28	0	0	3	27	30
		3		Mohina	17.03.2023	30	21	9	13	17	0	0	30
		4		Hahdali	17.03.2023	30	2	28	0	0	0	30	30
		5		Bhelamari	25.03.2023	30	8	22	18	9	3	0	30
		6	Barkhetri	Hidilattari	23.02.2023	30	9	21	19	11	0	0	30
		7		Hidilattari	24.02.2023	30	10	20	20	10	0	0	30
		8		Lawpara	03.03.2023	30	30	0	15	10	5	0	30
		9		Kaldi	18.03.2023	30	23	7	10	12	8	0	30
		10		Bezpara	27.03.2023	30	21	9	30	0	0	0	30
14	Shivsagar	1	Sivasagar	Konwarpur	09.02.2023	30	22	8	2	28	0	0	30
		2		Borpatro	04.03.2023	28	19	9	14	12	2	0	28
		3	Demow	Sessamukh	24.02.2023	29	18	11	0	0	1	28	29
		4		Demowmukh	01.03.2023	30	21	9	0	0	0	30	30
		5		Bhekurichapori	06.03.2023	26	19	7	4	1	2	19	26
		6		Gohaingaon	11.03.2023	29	20	9	3	26	0	0	29
		7	Gaurisagar	2 No. Chintamoni	23.02.2023	24	17	7	8	9	2	5	24

		8		1 No. Chintamoni	02.03.2023	27	23	4	15	3	1	8	27
		9		Chintamoni gaon	03.03.2023	25	20	5	4	14	2	5	25
		10		Soraguri	24.03.2023	28	21	7	6	12	4	6	28
15	Sonitpur	1	Dhekiajuli	Gohain-Ali village	16.02.2022	29	18	11	0	28	1	0	29
		2		Natun Basti	16.02.2023	29	19	10	0	20	1	8	29
		3		Gohain Ali village	09.03.2023	30	19	11	2	27	0	1	30
		4		Amtol Bhergoan	18.03.2023	30	17	13	4	22	0	4	30
		5	Bihaguri	Palia Pukhuri gaon	14.02.2023	32	14	18	7	23	0	2	32
		6		Saraka Nirai ati village	15.02.2023	29	10	19	1	27	0	1	29
		7		Bordubia village	11.03.2023	24	16	8	0	15	9	0	24
		8		Baruadoloni village	26.03.2023	25	13	12	0	12	13	0	25
		9	Gabhoru	Jorghar No. 2	05.03.2023	28	20	8	22	6	0	0	28
		10		Jorghar No. 1	05.03.2023	26	16	10	19	7	0	0	26
		11		Da-gaon, Besseria	17.03.2023	22	18	4	0	22	0	0	22
		12		Besseria	28.03.2023	25	17	8	4	20	1	0	25
		13	Balipara	Buragaon Chapori village	04.02.2023	35	33	2	2	33	0	0	35
		14		No. 1 Dimapur village	17.02.2023	25	25	0	0	0	0	25	25
		15		Jowguloni village	18.02.2023	25	25	0	9	16	0	0	25

		16		Nalghagori village	21.02.2023	32	18	14	0	31	0	1	32
		17	Rangapara	Dahalapara village	07.02.2923	31	22	9	0	9	0	22	31
		18		Dhulapadung	24.03.2023	28	12	16	1	20	0	7	28
		19		Natun Ghatua	25.03.2023	26	20	6	4	6	1	15	26
		20	Biswanath	Panibharal village	14.02.2023	26	21	5	5	3	18	0	26
		21		Dakshin Birgaon	04.03.2023	27	25	2	10	0	17	0	27
		22		Bhirgoan	06.03.2023	29	24	5	10	0	19	0	29
		23	Chaiduar	Baruah Pather village	09.02.2023	27	25	2	7	15	3	2	27
		24		Tetun Pukhuri	22.02.2023	29	22	7	4	23	0	2	29
		25		Jorabari village	24.02.2023	26	17	9	6	12	6	2	26

Glimpses of field Day Training Programme organized during 2022-23 under ICAR-DRMR-OPIU (Agri)-APART Project

Barpeta

Bongaigaon

Darrang

Dhemaji

Dhubri

Golaghat

Jorhat

Kamrup

Kokrajhar

Lakhimpur

Morigaon

Nagaon

Nalbari

Nalbari

Sivasagar

Sivasagar

Sonitpur

Sonitpur

2.3. Trainings of post-harvest technology demonstrations of rapeseed-mustard organized during 2023-23.

Post-harvest technology is an inter-disciplinary science and technique applied to agriculture produce after harvest for its protection, conservation, processing, packaging, distribution, and utilization to meet the food and nutritional requirements of the people in relation to their needs. After being harvested, the mustard under goes a series of post-harvest operations such as threshing, cleaning, transportation and storage management.

Proper handling, packaging, transportation and storage reduces the post-harvest losses in mustard. The technology has become a necessity to improve the food safety and strengthen nation's food security. The technology helps to boost export of agricultural commodities in the form of preserved and value added products.

Keeping in view the importance of post-harvest management of mustard, it was planned that ICAR-DRMR would support to APART in organizing at least one PHT (Post-Harvest Technology) demonstration training in each selected cluster with its post-harvest expertise. A total of 45 PHT demonstration trainings were organized against the 45 approved PHT demonstrations for 2022-23, in 55 clusters of 15 selected districts during February-March 2023. Farmers were demonstrated the post-harvest techniques and activities through these trainings. The following aspects were covered during these trainings to impart the knowledge and skill of post-harvest techniques to the participants.

Threshing: Farmers were trained about threshing which should be done when moisture content in seed is between 15-20%. When crop is very dry (6-12 % moisture), it will be tuff to minimize the post-harvest losses. Make bundles of the harvested plants and stalk them in the sun drying for 7-8 days before threshing. Threshing should be done either treading by bullocks or running of tractor over the dried plants or using threshers. Seeds should be separated from chaffs by winnowing.

Importance of Storage: Good storage facilities are important to the farmers all over the world. It helps to ensure household and community food security until the next harvest and commodities for sale can be held back so farmers can avoid being forced to sell at low prices in the glut that often follows a harvest. Though considerable losses occur in the field, both before and during harvest, the greatest losses are noticed during storage. Farmers were trained as how to minimize losses during storage.

i). Loss in quantity: Farmers were imparted knowledge about weight or quantitative losses. Insects, rodents, etc. feeds on the product causing weight loss. These weight losses are not always apparent. For example, some insects eat only the centres of grain kernels so, even though the volume of grain may appear to remain the same, there can be considerable weight loss.

ii). Loss in quality: Losses of this type can be nutritional, chemical, through contamination with toxic molds or foreign matter. Pests that selectively eat a part of the food-stuff (such as the nutritious germ of the grain) can reduce the value of the food-stuff as a whole. Farmers were trained to reduce the qualitative losses.

Storage management: Neat and clean seeds should be stored at appropriate moisture content. An adverse effect observed when seeds of mustard are stored in hot weather with high moisture content. For safe and long viability storage, mustard seeds should be dried at appropriate moisture. For safe storage, moisture content of seeds should be 8%. This can be achieved by sun drying of the threshed seed for approximately one week.

Principles of Storage: In order to reduce the amount of losses, the environment in the storage needs to be controlled so as to lower the possibility of:

- Biological damage by insects, rodents and micro-organisms.
- Chemical damage through rancidity development and flavour changes, etc.
- Physical damage through crushing, breaking, etc.

Good storage thus involves controlling the factors like temperature, moisture, light, pests and hygiene.

i). Temperature

The temperature within a store is affected by the sun, the cooling effect of radiation from the store, outside air temperature, heat generated by the respiration of both the store material and any insect pest present.

ii) Moisture

All micro-organisms, including molds, require moisture to survive and multiply. If the moisture content in a product that is to be stored is low, micro-organisms will be unable to grow, provided that the moisture inside the storage structure is also kept low. Moisture should therefore, be pre- vented from entering the store.

Precautions for safe storage:

1. Storage facility should be far away from mustard field and it should be neat and clean.
2. Transport vehicles used in mustard transportation such as bullock, truck and tractor trolley etc. should be insect free before storage of mustard seeds.
3. Seeds should be sun dried in the day and in the evening it should be fill in the bags.
4. Packing bags used in should be dried, new and insect free.
5. All cracks and holes in roof and floor should be closed with the cement and flat the floor in storage house.
6. Holes of rats should be closed with the cement in storage house.
7. New seed should not be mixed with old seeds because old seed may have infestation of insects.
8. Insect and disease affected seeds should not be stored.
9. Inspection should be repeated time to time in storage.

Precautions before oil extraction:

- Seed should be neat and clean before oil extraction process.
- Seed should be properly dried.
- There should be no straw and other materials in the seed.

Oil packaging and storage

Use clean, dry containers to pack and store oils. Sealed glass or plastic bottles are adequate for small quantities. Colored containers in a dark box help increase shelf life. Steel or plastic tanks work well for large quantities. The shelf life of oil is usually 6 to 12 months if it is properly packed and kept away from heat and sunlight. A total of 1273 farmers and farm women participated in PHT demonstration trainings. The detail information and summary of trainings of PHT demonstrations are presented in Table 12 &13, respectively.

Table 12: Details of training of PHT demonstration organised during 2022-23

SN	District	Cluster	Name of Cluster	Place/Village	Date	Beneficiaries (No.)							
							Gender		Social Category				
							Male	Female	GEN	OBC	SC	ST	Total
1.	Barpeta	1	Gumafulbari	Bor-Suha	26.05.2023	40	24	16	40	0	0	0	40
		2	Barpeta	Keotkuchi	13.05.2023	30	30	0	26	2	2	0	30
		3	Bhawanipur	Kuchijhar	25.05.2023	30	24	6	0	0	0	30	30
2	Bongaigaon	1	Manikpur	Dompara	09.06.2023	30	16	14	0	28	0	2	30
		2	Patiladoha	Nowpara	09.06.2023	30	28	2	2	24	3	1	30
		3	Bidyapur	Nachankuti	27.06.2023	32	31	1	9	23	0	0	32
3	Darrang	1	Bechimari	Bechimari	30.05.2023	30	28	2	30	0	0	0	30
		2	Sipajhar	Salmara	31.05.2023	30	19	11	0	22	8	0	30
		3	Pachim Mangaldoi	Gariapara	01.06.2023	30	22	8	0	26	4	0	30
4	Dhemaji	1	Murkong	Magurmari	31.05.2023	30	22	8	0	1	0	29	30
		2	Sissiborgaon	Taranipathar	31.05.2023	30	8	22	0	30	0	0	30
		3	Machkhowa	Sissimukh	01.06.2023	30	9	21	0	0	29	1	30
5	Dhubri	1	Gauripur	Tisterpar	20.05.2023	37	27	10	37	0	0	0	37
		2	Mahamaya	Shimlabari Pt-II	23.05.2023	43	20	23	43	0	0	0	43
		3	Chapar-Salkocha	Patakata Pt-II	22.05.2023	34	15	19	34	0	0	0	34
		4	Rupshi	Kiamari Pt-II	28.05.2023	35	12	23	35	0	0	0	35
6	Golaghat	1	Bokakhat	Missimiati	08.05.2023	30	25	5	7	3	2	18	30
				CharahMising	08.05.2023	28	25	3	14	2	1	11	28
		2	Morangi	3No. Kaibaira	29.04.2023	30	16	14	1	2	23	4	30
7	Jorhat & Majuli	1	Kaliapani	Bamunpukhuri	27.05.2023	31	22	9	11	20	0	0	31
		2	Dhekorgorah	Chinaichuk	29.05.2023	26	15	11	4	8	10	4	26
		3	Majuli	MRBFPC office	05.06.2023	20	17	3	6	9	3	2	20

8	Kamrup	1	Sualkuchi	Bongshor	10.04.2023	26	12	14	20	6	0	0	26
		2	Hajo	Halogaon	12.04.2023	23	15	8	12	4	7	0	23
		3	Kamalpur	Baruajani	13.04.2023	24	14	10	10	12	2	0	24
9	Kokrajhar	1	Kokrajhar	Dobragaon	04.05.2023	24	16	8	0	24	0	0	24
		2	Dotama	Hogmabil	05.05.2023	26	17	9	0	0	0	26	26
		3	Kachugaon	Saraibil	08.05.2023	22	20	2	0	0	0	22	22
10	Lakhimpur	1	Ghilamara	Lamudeowalia	22.05.2023	20	9	11	0	19	1	0	20
		2	Narayanpur	Bahupathar	26.05.2023	18	13	5	4	12	2	0	18
		3	Karunabari	Sandohkhowa	26.05.2023	16	9	7	16	0	0	0	16
11	Morigaon	1	Bhurbandha	Akhuj FPC	08.05.2023	30	18	12	2	18	0	10	30
		2	Kapili	Mahabahu FPC	11.05.2023	25	10	15	5	20	0	0	25
12	Nagaon	1	Kaliabor	Keribakori	19.04.2023	25	15	10	4	13	8	0	25
		2	Pachim Kaliabor	Namgaon	19.04.2023	24	13	11	17	5	0	2	24
		3	Khagorijan	Kachamari	24.04.2023	25	7	18	7	17	0	1	25
		4	Raha	Kunwariati	24.04.2023	28	15	13	9	12	5	2	28
13	Nalbari	1	Barkhetri	Hidilattaei	18.05.2023	**30**	**0**	**30**	22	8	**0**	**0**	**30**
14	Shivsagar	1	Demow	Molihamari	12.05.2023	25	4	21	1	23	0	1	25
		2	Gaurisagar	Chintamoni	16.05.2023	30	19	11	30	0	0	0	30
15	Sonitpur	1	Gabhoru	Besseria	06.05.2023	31	31	0	1	30	0	0	31
		2	Bihaguri	Puthimari	10.05.2023	24	0	24	0	7	13	4	24
		3	Dhekiajuli	Amtol Bhergaon	12.05.2023	30	21	9	2	20	0	8	30
		4	Balipara	Dakhin Amloga	22.05.2023	31	16	15	0	0	0	31	31
		5	Biswanath	Bhirgaon	23.05.2023	30	24	6	0	0	30	0	30

Table 13: Summary of PHT demonstrations under ICAR-DRMR-APART project during 2022-23

SN	Activity	Target (No.)	Achieved (No.)	Beneficiaries (No.)	Beneficiaries (No.)						
					Gender		Social Category				Total
					Male	Female	Gen	OBC	SC	ST	
1	Post-Harvest Technology	45	45	1273	773	500	461	450	153	209	1273

Glimpses of Post-harvest management Training Programme organized during 2022-23 under ICAR-DRMR-OPIU (Agri)-APART Project

Barpeta

Bongaigaon

Darrang

Dhemaji

Dhubri

Golaghat

Glimpses of Post-harvest management Training Programme organized during 2022-23 under ICAR-DRMR-OPIU (Agri)-APART Project

Jorhat

Kamrup

Kokrajhar

Lakhimpur

Morigaon

Nagaon

Glimpses of Post-harvest management Training Programme organized during 2022-23 under ICAR-DRMR-OPIU (Agri)-APART Project

Nalbari

Nalbari

Sivasagar

Sivasagar

Sonitpur

Sonitpur

2.4. Farmer Fair organized on April 25, 2023 at Morigaon district of Assam.

Farmer fair is an important agriculture extension activity which provides a platform of all stakeholders. The technical sessions are organized in fair in which experts provide the scientific knowledge and solution of agriculture problems to the farmers. The participants get the knowledge of different farm products, varieties, fertilizers, other inputs, agriculture machineries, etc through exhibition organized in the fair. The farmers, scientists, extension personnel, input dealers, agriculture companies, agriculture machineries manufactures, NGOs, FPOs, etc participates in farmer fair and to share their knowledge and experiences.

In this background, as per approved activity under ICAR-DRMR-APART project for 2022-23, a farmer fair was organized on April 25, 2023 in the premises of old agriculture office of Morigaon district of Assam by District Agriculture Office, Morigaon in collaboration with ICAR-DRMR, Bharatpur, Rajasthan. On the occasion, a number of FPCs showcased their different products of agriculture, horticulture and sericulture products at their exhibition stalls.

Sh. Devashish Sharma, Deputy Commissioner, Morigaon inaugurated the farmer fair as a chief guest. Thereafter along with other dignitaries from ICAR-DRMR, KVKs, Fishery and Veterinary departments, etc, he visited all exhibition stalls and interacted with organizers of the stalls about their work and products.

After visiting the exhibition stalls, inaugural session was started with welcome address by Sh. Ashok Kumar Sharma, DAO, Morigaon. Thereafter in inaugural speech, Sh. Devashish Sharma, Deputy Commissioner of Morigaon district said that lack of scientific knowledge and their adoption among farmers on cultivation practices of various agricultural crops are the main reason for low production and productivity in the district. He asked the Department of Agriculture to focus on scientific trainings of the farmers with the help of experts and also urged the farmer to Change their reluctant attitude towards the innovations and adopt the scientific practices in enhance the production. He also emphasized that high use of pesticides and chemical fertilizers are causing many human diseases like cancer, heart attack, etc. therefore, farmers should adopt the responsible agriculture avoiding excessive use of chemicals in farming and taking care of people's food quality while making production and profit from agriculture. He also mentioned that farmers are facing the problem in proper marketing of their produce and farm to market linkage should be strengthen so that farmers can get the proper price of their commodity. He appreciated the efforts of ICAR-DRMR for promoting scientific mustard cultivation in Assam that will help in making the state self sufficient in oilseed production.

Addressing the participants, Dr. Ashok Kumar Sharma, Team Leader and Pr. Scientist, ICAR-DRMR-APART project said that consumption of mustard oil is natural preferences of the people of Assam. But the production of mustard is very less against the total demand in the state. This huge gap of demand and supply is bridged by supplying the mustard oil from other states especially from Rajasthan. The productivity of mustard is about 660 kg/ha in Assam against the national productivity of about 1500kg/ha. Since Assam has a good production potential of mustard if the cultivation is coupled with adoption of scientific technology of rapeseed-mustard. Further, a large area is lying vacant after Sali paddy, out of which a substantial area can be brought under mustard cultivation. Many improved varieties and technologies of rapeseed-mustard have been developed by our researchers which are suitable for Assam. Therefore, ICAR-DRMR is working as knowledge partner with Department of Agriculture, Govt. of Assam for promotion of scientific technology of rapeseed-mustard and their adoption among the farmers in the state through organizing number of extension activities like conducting crop demonstrations, training programmes, exposure visits, field days, farmer fair, distribution of literatures, etc. Dr. Sharma stressed that all agencies or departments, KVKs, SAUs, seed corporations, etc should work in coordination and ensure timely dissemination of technology and availability of all required inputs need for mustard cultivation. He also urged farmers that they should come forward to bring more area under scientific cultivation of mustard and witness a second yellow revolution in Assam.

Dr. G.N Hazarika, Resident Consultant, ICAR-DRMR-APART project said that flood problem in some areas, long duration of rice varieties, lack of irrigation facilities, unavailability of quality seed of rapeseed-mustard timely, stray animals, etc. are some of the problems being faced by farmers in rapeseed-mustard cultivation.

He asked the farmers to adopt short duration sali paddy varieties so that timely mustard can be cultivated to a large extent and get higher yield. He said that multiple cropping system should be adopted by the farmers to get more profit and avoiding effect of climate changes.

The technical sessions were carried thereafter by Dr.G.N. Hazarika, Resident Consultant; Ms. Moukham Wakhet , SRF, Morigaon; Ms Komedity Chamua, SRF, Nagaon of ICAR-DRMR-APART project. The session mainly focused on scientific technology of rapeseed-mustard for higher production in Assam. The improved agronomic practices, disease, Insect and pest management, seed production technology and post harvest management of rapeseed-mustard.

Sh. Madhuram Patiri, Joint Director and Nodal, OPIU (Agri)-APART addressed the participants and highlighted the importance of rapeseed-mustard crop in Assam and various other crops like millets, gram and fodder in the district. He also talked about market linkage and MSP. He also apprised about mustard area expansion programme. He thanked the FPCs and the Agriculture Department and ICAR-DRMR for collaborating and organising such a wonderful programme and praised the department staff and farmers for enthusiastic participation and making the programme a grand success. Ceremonial distribution of power tillers under RKVY was done by Hon'ble DC. More than 100 farmer and farm women participated in the fair.

Table 14: Summary of participants of farmer's fair organized on April 25, 2023 at Morigaon district of Assam.

SN	Activity	Target (No.)	Achieved (No.)	Beneficiaries (No.)	Beneficiaries (No.)						
					Gender		Social Category				Total
					Male	Female	Gen	OBC	SC	ST	
1	Farmer's fair	01	01	130	78	52	33	41	24	32	**130**

Glimpses of Farmers' fair-2022 under ICAR-DRMR- OPIU (Agri)-APART Project- 2022-23

Glimpses of Farmers' fair-2022 under ICAR-DRMR- (OPIU (Agri)-APART Project- 2022-23

2.5: Conference on Buyer Seller Meet organized at KVK, Kamrup on April 27, 2023

As per the approved activity, a Conference on Buyer-Seller Meet was organized by District Agriculture Office, Kamrup with technical support of ICAR-DRMR at Krishi Vigyan Kendra, Kahikuchi Campus, Kamrup on April 27, 2023 under ICAR-DRMR-OPIU (Agri)-APART Project 2022-23. The main objective of the conference was to bridge the gap between the interested buyer and potential Seller (FPC/FPO/Individual farmers) for the mustard.

The programme was graced by Dr. Ashok Kumar Sharma, Team Leader & Pr. Scientist, ICAR-DRMR-APART project; Dr. G. N. Hazarika, Resident Consultant, ICAR-DRMR-APART project; Dr. D. N. Kalita, P.C, KVK, Kamrup; Mr. Bimala Prasad Deori, DAO, Kamrup and Mr. Karthik M., Monitoring and Evaluation Specialist-OPIU (Agri.) and Mr. Manash Protim Mahanta, Nodal officer-APART.

The Meet was begun with welcome speech by Mr. Manash Protim Mahanta. The chief guest of the programme, Dr. Ashok Kumar Sharma, Team Leader & Pr. Scientist, ICAR-DRMR- APART project said that Assam has vast potential for production of mustard crop. Besides other programmes, Govt. of Assam has also launched mustard area expansion programme since 2022-23 crop season to cover rice fallow area under mustard cultivation. The farmers are adopting scientific technology of mustard to increase the productivity of the crop after the implementation of ICAR-DRMR-APART project since 2020-21. The increased production needs proper market also so that producer can get the fair price of their produce. If farmers do not get remunerative price of mustard they will get discouraged. Therefore, it should be ensured that farmers can access the all market opportunities to sell their produce. In this background, this conference of buyer-seller meet will provide a platform for buyers and sellers to interact with each other's and discuss about the price, quantity and quality of the mustard and future demands. The sellers get the opportunity to showcase their product and help the buyers to analyse the samples and make direct linkages with farmers. Such programme avoids the presence of brokers between the buyers and sellers. Dr. Sharma also briefed the participants about different varieties of mustard, their availability, suitability in Assam climate, various challenges, oil extraction process, oil quality, etc.

Dr. G. N. Hazarika, Resident Consultant of ICAR-DRMR-OPIU (Agri.)-APART project briefed the overview of the activities of the project, scope and opportunities of mustard cultivation in Assam, problems of farmers in mustard cultivation, importance of buyer-seller meet and said that this type of programme will help both buyer and seller of mustard commodity.

Mr. Bimala Prasad Deori, DAO, Kamrup said that the impact of the project is clearly visible and there is substantial increase in area and production of mustard crop during last three years. The department is continuously motivating farmers to adopt the improved varieties and scientific technology of mustard.

Dr. D. N. Kalita, P.C, KVK, Kamrup and Mr. Karthik M, Monitoring and Evaluation specialist-OPIU (Agri) covered various constraint associated with post-harvest management, and marketing linkages, etc.

An interaction session among dignitaries/experts and participants was also organized during the programme. Mr. Dibakar Mohodi, DAMC-APART; Others APART officials; ATMA-BTMs/ATMs of different blocks of Kamrup district were also present in the programme. Around 85 sellers and buyers or FPC shareholder participated in the programme. Mr. Dibakar Mohodi, DAMC-APART coordinated the programme and Sanjukta Phukan, DSC-APART delivered vote of thanks.

Glimpses of Conference on Buyer-Seller Meet organized at KVK, Kamrup on April 27, 2023 under ICAR-DRMR-OPIU (Agri)-APART Project- 2022-23

Glimpses of Conference on Buyer-Seller Meet organized at KVK, Kamrup on April 27, 2023 under ICAR-DRMR-OPIU (Agri)-APART Project- 2022-23

3. Workforce involved in the assignment:

In APART, ICAR-DRMR has appointed the key and non-key experts to take care of the project activities during the period. The list of ICAR-DRMR staff engaged in the project and locally appointed staff are given in Tables 15 and 16.

Table 15: Client's ICAR-DRMR staff engaged

SN	Name of Experts	Key or Non-Key	Designation in ICAR-DRMR	Designation in APART	Place of deployment	Date of availability for work in the assignment
1	Dr. P.K. Rai	Key	Director	Chief Advisor	Bharatpur	In place
2	Dr. Ashok Kumar Sharma	Key	Principal Scientist (Ag. Extension)	Team Leader	Bharatpur	In place
3	Dr. Harvir Singh	Key	Scientist (Agronomy)	Expert	Bharatpur	In place
4	Dr. Pankaj Sharma/	Non-key	Pr. Scientist (Plant Pathology)	Expert	Bharatpur	In place
5	Dr. Vinod Kumar/	Non-key	Pr. Scientist (Comp. Appl.)	Expert	Bharatpur	In place
6	Dr. Arun Kumar	Non-key	Pr. Scientist, (Plant Breeding)	Expert	Bharatpur	In place
7	Dr. Narpat Singh	Non-key	Research Associate	Research Associate	Bharatpur	In place
8	Ms. Anita	Non-key	Data entry Operator	Data entry Operator	Bharatpur	In place

Table 16: Client's local staff engaged

SN	Name of Experts	Key or Non-Key	Designation in ICAR-DRMR	Designation in APART	Place of deployment	Date of availability for work in the assignment
1.	Dr. G.N. Hazarika	Key	Resident Consultant	Resident Consultant	Guwahati	In place
2.	Dr. Joli Dutta	Non-key	Research Associate	Research Associate	Sivsagar	In place
3.	Ms. Sukanaya Gogoi	Non-key	Sr. Research Fellow	Sr. Research Fellow	Golaghat	In place
4.	Dr. Vijay Kumar	Non-key	Research Associate	Research Associate	Barpeta	In place
5.	Ms. Chayanika Borha	Non-key	Sr. Research Fellow	Sr. Research Fellow	Lakhimpur	In place
6.	Dr. Bandhan Subha	Non-key	Research Associate	Research Associate	Sonitpur	In place
7.	Ms. Lohita Rabba	Non-key	Sr. Research Fellow	Sr. Research Fellow	Darrang	In place
8.	Mr. Mohd. Danish	Non-key	Sr. Research Fellow	Sr. Research Fellow	Dhubri	In place
9.	Ms. Binita Basumatary	Non-key	Sr. Research Fellow	Sr. Research Fellow	Bongaigaon	In place
10.	AKANTA PAUL	Non-key	Sr. Research Fellow	Sr. Research Fellow	Kokrajhar	In place
11.	Ms. Manisha Barman	Non-key	Sr. Research Fellow	Sr. Research Fellow	Nalbari	In place
12.	Mr.Imonjyoti Das	Non-key	Sr. Research Fellow	Sr. Research Fellow	Kamrup	In place
13.	Ms. Moukham Wakhet	Non-key	Sr. Research Fellow	Sr. Research Fellow	Morigaon	In place
14.	Ms. Sanjana Bora	Non-key	Sr. Research Fellow	Sr. Research Fellow	Nagaon	In place
15.	Ms. Nilakhi Dutta	Non-key	Sr. Research Fellow	Sr. Research Fellow	Jorhat	In place
16.	Mr. Dipankar sonowal	Non-key	Sr. Research Fellow	Sr. Research Fellow	Dhemaji	In place
17.	Mr. Banikanto Patri	Non-key	Office Assistant cum comp. Operator	Office Assistant cum comp. Operator	Guwahati	In place

4. Consultants Invoice and payment by the client:

Table 17. Invoice details

SN	Invoice No. and Date	Date of submission of invoice to OPIU	Date of clarification sought by OPIU, If any	Date of replies given by the consultant, if any	Date of payment by OPIU
1	ICAR-DRMR-APART-2019.20.4 dated 14.5.2020 Rs. 43.12 lakh	17.6.2020	NA	NA	5.10.2020
2	ICAR-DRMR / TAD ./APART / 2020-21 /86 dated 2.2.2021 Rs. 38.81 Lakh	2.2.2021	NA	NA	20.5.2021
3	ICAR-DRMR-TAD-APART /2020-21 /118 dated 28.6.2021 Rs. 30.18 Lakh	28.6.2021	NA	NA	15.7.2021
4	ICAR-DRMR-TAD-APART/2021-22/171 (Rs. 52.03 lakh)	02.12.2021	Nil	Nil	28.12.2021
5	ICAR-DRMR-TAD/APART-2021-22./207 (Rs.101.11 lakh)	15.2.2022	Nil	Nil	30.3.2022 (Rs. 94.63 Lakh) and 17.8.2022 (6.48 lakh)
6	ICAR-DRMR / TAD/ APART/ 2022-23/ 47-I (Rs. 76.87 lakh)	24-9-2022	Nil	Nil	30-11-2022 (50.0 Lakh) and 31-3-2023 (26.87734)
7	ICAR-DRMR/TAD/APART/ 2022-23/ 137-I (Rs. 143.56 Lakh)	14-3-2023	Nil	Nil	19-6-2023
8	ICAR-DRMR/TAD/APART/ 20223-24/ 188 (Rs. 20.055Lakh)	9-8-2023	Nil	Nil	Pending

5. Contractual issues (if any) and changes desired: Nil

6. Work plan for the next six months

Table 18: Month-wise work-plan

SN	Month wise activities	Nos.
Aug 2023		
1	Awareness meetings	30
2	Base line survey	15
September 2023		
1	Awareness meetings	30
2	Base line survey	15
3	Selection of locations for demonstrations	5000
4	Selection of beneficiaries	5000
5	Working out the seed distribution plan	15
October 2023		
1	Training of the farmers	01
2	Training of Master trainers	01
3	Distribution of seeds, fertilizers and other required inputs	5000
4	Organization of technical trainings	50
November 2023		
1	Sowing of crop demonstrations	5000
2	Organization of technical trainings	100
3	Publications of training manual and extension folders	02
December 2023		
1	Organization of technical trainings	50
2	Monitoring of crop demonstrations	5000
January 2024		
1	Organization of technical trainings	50
2	Exposure visit of farmers	01
3	Exposure visit of master trainers	0
4	Development of video film	01
5	Monitoring of crop demonstrations	5000

7. Summary of the overall progress.

The achievements and results of the period under report are summarised in the table 19, below.

Table 19. Summary of the progress of work done during February-July 2023

Activities	Unit	Target	Achievement	Remarks
Crop Demonstrations	No.	5000	5000	Completed
Minikit demonstrations	No.	18000	18000	Completed
Field days	No.	250	250	completed
PHT demonstrations	No.	45	45	Completed
Farmers Fair	No.	1	1	Completed
Conference on Buyer-Seller Meet	No.	1	1	Completed

Annexure-I: 104 to 126

Table 1a: Performance of different varieties in crop demonstrations (CD) conducted in Barpeta district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Barpeta	DRMR-150-35 PM- 28	18	1514 (1330-1725)	768 (683-835)	97.13	28530	22792	82513	41856	34919	2.89	1.83
	TS-38	31	1289 (1133-1410)	723 (683-960)	78.28	26480	21708	70251	39404	26075	2.65	1.18
Overall IR CD in Barpeta	**DRMR-150-35 PM- 28, TS38**	**49**	**1402 (1133-1725)**	**746 (592-960)**	**87.93**	**27233**	**22106**	**76409**	**40657**	**30619**	**2.80**	**1.83**
Rainfed condition												
Barpeta	DRMR-150-35 PM-28	241	1118 (705-1365)	632 (433-855)	76.89	22779	19441	60931	34444	23149	2.67	1.77
	TS-38	89	878 (705-1200)	544 (410-765)	61.39	20643	17585	47851	29648	15145	2.31	1.68
Overall RF CD in Barpeta	**DRMR-150-35 PM-28, TS-38**	**330**	**998 (705-1365)**	**588 (433-855)**	**69.72**	**22203**	**18950**	**54391**	**32046**	**19092**	**2.44**	**1.69**
Overall CD in Barpeta	**All varieties in both situations**	**379**	**1200 (705-1725)**	**667 (433-960)**	**79.91**	**22853**	**19358**	**65400**	**36352**	**25553**	**2.86**	**1.87**

Table 1b: Average performance of mustard and toria varieties in Barpeta district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Barpeta	PM-28	9	1540 (1455-1725)	783 (725-835)	96.68	28480	22600	83930	42674	33376	2.94	1.88
	DRMR-150-35	9	1488 (1330-1650)	753 (683-828)	97.60	28580	22983	81096	41039	34460	2.83	1.78
	TS-38	31	1289 (1133-1410)	723 (592-960)	78.28	26480	21708	70251	39404	**26075**	**2.65**	**1.8**
Rainfed condition												
Barpeta	PM-28	134	1122 (743-1365)	641 (433-828)	75.03	22777	19558	61149	34935	22995	2.68	1.78
	DRMR-150-35	107	1113 (705-1365)	623 (435-855)	78.65	22781	19324	60659	33954	23248	2.66	1.76
	TS-38	89	878 (705-1200)	544 (410-765)	61.39	20643	17585	47851	29648	15145	2.31	1.68

Table 2a: Performance of different varieties in crop demonstrations (CD) conducted in Bongaigaon district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Bongaigaon	DRMR-150-35 NRCHB 101, PM-28	20	1196 (988-1438)	751 (642-855)	59.25	25420	20913	65182	40930	19745	2.56	1.95
	TS-38	10	968 (840-1142)	654 (580-738)	48.01	23259	19317	52756	35643	13171	2.26	1.84
Overall IR CD in Bongaigaon	**DRMR 150-35 NRCHB-101 PM-28, TS-38**	**30**	**1120 (840-1438)**	**719 (580-855)**	**55.77**	**24700**	**20381**	**61040**	**39186**	**17535**	**2.47**	**1.92**
Rainfed condition												
Bongaigaon	DRMR-150-35 NRCHB 101, PM-28	154	1076 (432-1350)	702 (372-894)	53.27	23844	19667	58642	38259	16206	2.45	1.94
	TS-38	107	927 (720-1086)	650 (550-780)	42.61	22920	19076	50522	35425	11253	2.20	1.85
Overall RF CD in Bongaigaon	**DRMR-150-35, NRCHB 101, PM-28, TS-38**	**261**	**1015 (432-1350)**	**681 (372-894)**	**49.04**	**23465**	**19425**	**55318**	**37115**	**14163**	**2.35**	**1.91**
Overall CD in Bongaigaon	**All varieties in both situations**	**291**	**1026 (432-1438)**	**685 (372-894)**	**49.78**	**23593**	**19523**	**55917**	**37333**	**14514**	**2.37**	**1.91**

Table 2b: Average performance of mustard and toria varieties in Bongaigaon district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Bongaigaon	DRMR-150-35	4	1302 (1224-1438)	806 (725-855)	61.53	25751	21084	70959	43927	22365	2.75	2.08
	PM-28	11	1184 (1016-1290)	747 (642-796)	58.50	25450	21082	64528	40712	19448	2.53	1.93
	NRCHB-101	5	1139 (988-1234)	717 (665-764)	58.85	25089	20405	62076	39077	18315	2.47	1.91
	TS-38	10	968 (840-1142)	654 (580-738)	48.01	23259	19317	52756	35643	13171	2.26	1.84
Rainfed condition												
Bongaigaon	DRMR-150-35	46	1095 (930-1350)	721 (592-894)	51.87	24094	19592	59678	39295	13881	2.47	2.00
	PM-28	63	1070 (432-1342)	699 (372-794)	53.07	23750	19537	58315	38096	16006	2.45	1.94
	NRCHB-101	45	1065 (876-1288)	689 (586-782)	54.57	23721	19925	58043	37551	16696	2.44	1.88
	TS-38	107	927 (720-1086)	650 (550-780)	42.61	22920	19076	50522	35425	11253	2.20	1.85

Table 3a: Performance of different varieties in crop demonstrations (CD) conducted in Darrang district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Darrang	PM-28	11	1507 (1355-1875)	852 (706-989)	76.87	31500	28200	82132	46434	32398	2.60	1.64
	TS-38	25	1063 (960-1295)	686 (502-921)	54.95	28283	22653	57934	37387	14917	2.04	1.65
Overall IR CD in Darrang	**PM-28, TS-38**	**36**	**1199 (960-1875)**	**737 (502-989)**	**62.68**	**29266**	**24348**	**65346**	**40167**	**19661**	**2.18**	**1.64**
Rainfed condition												
Darrang	DRMR-150-35 NRCHB- 101 PM-28	189	926 (650-1221)	611 (502-809)	51.55	24399	21356	50467	33230	14194	2.06	1.55
	TS-38	75	956 (746-1250)	643 (516-806)	48.67	24700	21457	52102	35044	13815	2.10	1.63
Overall RF CD in Darrang	**DRMR 150-35, PM-28 NRCHB-101, TS-38**	**264**	**922 (650-125)**	**607 (502-806)**	**51.89**	**24358**	**21243**	**50249**	**33082**	**14052**	**2.06**	**1.55**
Overall CD in Darrang	**All varieties in both situations**	**300**	**955 (650-1875)**	**622 (451-989)**	**53.53**	**24946**	**21615**	**52048**	**33899**	**14818**	**2.08**	**1.56**

Table 3b: Average performance of mustard and toria varieties in Darrang district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Darrang	PM-28	11	1507 (1355-1875)	852 (706-989)	76.87	31500	28200	82132	46434	32398	2.60	1.64
	TS-38	25	1063 (960-1295)	686 (502-921)	54.95	28283	22653	57934	37387	14917	2.04	1.65
Rainfed condition												
Darrang	PM-28	59	1017 (826-1221)	636 (520-789)	59.90	25008	21790	55427	34662	17547	2.21	1.19
	TS-38	75	956 (746-1250)	643 (516-806)	48.68	24700	21457	52102	35044	13815	2.10	1.63
	NRCHB-101	50	888 (650-1014)	581 (502-756)	52.83	24218	21071	48396	31665	15584	1.99	1.50
	DRMR-150-35	80	840 (726-1009)	567 (451-809)	48.14	23645	20746	45750	30902	11953	1.93	1.48

Table 4a: Performance of different varieties in crop demonstrations (CD) conducted in Dhemaji district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Mean Seed Yield (Kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Dhemaji	PM-28	70	1165 (925-1305)	754 (607-960)	54.50	25949	22011	63493	41093	18462	2.44	1.86
	NRCHB-101	50	1104 (968-1275)	745 (605-917)	48.18	26161	22371	60168	40603	15675	2.29	1.81
	DRMR-150-35	100	1088 (925-1282)	738 (555-917)	47.42	25517	21866	59296	40221	15444	2.32	1.83
	TS-38	180	936 (689-1200)	636 (472-812)	47.16	23677	20243	51012	34662	13350	2.15	1.71
Overall RF CD in Dhemaji	**All varieties in rainfed situation**	**400**	**1037 (689-1305)**	**697 (472-960)**	**48.78**	**24863**	**21238**	**56517**	**37987**	**14905**	**2.27**	**1.78**

Table 4b: Average performance of mustard and toria varieties in Dhemaji district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Mean Seed Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Dhemaji	DRMR-150-35 NRCHB- 101 PM-28	220	1116 (925-1305)	744 (555-960)	50.00	25798	22023	60822	40548	16499	2.35	1.84
	TS-38	180	936 (689-1200)	636 (472-812)	47.16	23677	20243	51012	34662	13350	2.15	1.71

Table 5a: Performance of different varieties in crop demonstrations (CD) conducted in Dhubri district of Assam under irrigated situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Dhubri	DRMR-150-35 NRCHB-101, PM- 28	87	1444 (1005-1896)	777 (450-994)	82.58	33533	25053	78698	42347	27871	2.34	1.69
	TS-38	20	1334 (1050-1524)	706 (450-830)	88.95	30040	22600	72703	38477	26786	2.42	1.70
Overall IR CD in Dhubri	DRMR-150-35 NRCHB-101 PM- 28, TS-38	107	1389 (1005-1896)	742 (450-994)	87.19	32880	24595	75701	40439	26976	2.30	1.64
Rainfed condition												
Dhubri	DRMR-150-35, NRCHB-101, PM-28	186	1132 (705-1488)	620 (421-1102)	82.58	27647	20550	61694	33790	20807	2.23	1.64
	TS-38	93	969 (818-1145)	497 (421-714)	94.96	26400	18380	52811	27087	17704	2.00	1.47
Overall RF CD in Dhubri	**DRMR-150-35, NRCHB-101, PM-28, TS-38**	**279**	**1080 (705-1488)**	**596 (421-1102)**	**81.20**	**27231**	**19827**	**58860**	**32482**	**18969**	**2.16**	**1.63**
Overall CD in Dhubri	**All varieties in both situations**	**386**	**1235 (705-1896)**	**669 (421-1102)**	**84.60**	**28797**	**21148**	**67308**	**36461**	**23198**	**2.33**	**1.72**

Table 5b: Average performance of mustard and toria varieties in Dhubri district of Assam under irrigated situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Dhubri	PM-28	18	1514 (1328-1734)	812 (740-980)	86.45	32780	24860	82513	44254	30330	2.51	1.78
	DRMR-150-35	37	1439 (1250-1652)	751 (630-845)	91.61	33300	25150	78426	40930	29346	2.35	1.62
	NRCHB-101	32	1380 (1005-1896)	769 (550-994)	79.45	34225	21665	75210	41911	20739	2.19	1.93
	TS-38	20	1334 (1050-1524)	706 (450-830)	88.95	30040	22600	72703	38477	26786	2.42	1.70
Rainfed condition												
Dhubri	DRMR-150-35	41	1240 (1005-1488)	690 (523-1102)	79.71	28200	20150	67580	37605	21925	2.39	1.86
	PM-28	99	1114 (705-1452)	622 (740-980)	79.09	27300	20600	60713	33899	20114	2.22	1.64
	NRCHB-101	46	1041 (840-1288)	548 (425-710)	89.96	27900	20800	56735	29866	19769	2.03	1.43
	TS-38	93	969 (818-1145)	497 (421-714)	94.96	26400	18380	52811	27087	17704	2.00	1.47

Table 6a: Performance of different varieties in crop demonstrations (CD) conducted in Golaghat district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Golaghat	TS-38	120	1081 (460-1490)	685 (330-900)	57.81	25954	22169	58915	37333	17797	2.26	1.68
	DRMR-150-35 PM-28	80	1006 (450-1480)	705 (360-880)	42.69	26190	21951	54827	38423	12165	2.09	1.75
Overall RF CD in Golaghat	**All varieties in rainfed situation**	**200**	**1051 (450-1490)**	**693 (330-900)**	**51.65**	**26048**	**22082**	**57280**	**37769**	**15545**	**2.19**	**1.71**

Table 6b: Average performance of mustard and toria varieties in Golaghat district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Golaghat	TS-38	120	1081 (460-1490)	685 (330-900)	58.81	25954	22169	58915	37333	17797	2.26	1.68
	PM-28	50	1035 (450-1480)	718 (360-880)	44.15	26318	22045	56407	39131	13304	2.15	1.77
	DRMR-150-35	30	958 (705-1215)	683 (535-810)	40.26	25977	21794	52211	37224	10807	2.00	1.70

Table 7a: Performance of different varieties in crop demonstrations (CD) conducted in Jorhat including Majuli district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Jorhat	DRMR-150-35 NRCHB 101, PM-28	200	1133 (825-1500)	663 (462-900)	70.88	27994	24009	61749	36134	21654	2.20	1.50
	TS-38	100	966 (825-1150)	673 (514-845)	43.53	26732	23239	52647	36679	12498	1.97	1.57
Overall RF CD in Jorhat	**All varieties in rainfed situation**	**300**	**1077 (333-1500)**	**666 (400-900)**	**61.71**	**27573**	**23752**	**58697**	**36297**	**18579**	**2.12**	**1.52**

Table 7b: Average performance of mustard and toria varieties in Jorhat including Majuli district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed Condition												
Jorhat	PM-28	100	1216 (558-1500)	636 (462-818)	91.19	27634	23795	66272	34662	27771	2.39	1.45
	DRMR-150-35	50	1059 (712-1215)	684 (472-900)	54.82	27711	23834	57716	37278	16561	2.08	1.56
	NRCHB-101	50	1041 (600-1200)	694 (564-880)	50.00	28997	24610	56735	37823	14524	1.95	1.53
	TS-38	100	966 (333-1150)	673 (514-845)	43.53	26732	23239	52647	36679	12475	1.96	1.57

Table 8a: Performance of different varieties in crop demonstrations (CD) conducted in Kamrup district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties used in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Kamrup	DRMR 150-35 PM-28	80	1443 (1100-1785)	866 (710-1120)	66.62	27665	24930	78644	47197	28712	2.84	1.89
	TS-38	41	993 (862-1400)	769 (591-900)	29.12	27496	25328	54119	41911	10100	1.96	1.65
Overall IR CD in Kamrup	DRMR 150-35 PM-28, TS-38	121	1290 (862-1785)	833 (591-1120)	54.86	27608	25065	70305	45399	22363	2.54	1.81
Rainfed condition												
Kamrup	DRMR 150-35 PM-28	99	1071 (850-1400)	686 (522-950)	56.12	23981	21985	58370	37387	18987	2.43	1.70
	TS-38	177	903 (713-1250)	676 (514-920)	33.57	23685	21659	49214	36842	10346	2.07	1.70
Overall RF CD in Kamrup	**DRMR 150-35 PM-28, TS-38**	**276**	**963 (713-1400)**	**679 (514-950)**	**41.82**	**23791**	**21775**	**52484**	**37006**	**13534**	**2.20**	**1.69**
Overall CD in Kamrup	**All varieties in both situations**	**397**	**990 (713-1785)**	**669 (514-950)**	**47.98**	**24962**	**22789**	**53955**	**36461**	**15321**	**2.16**	**1.59**

Table 8b: Average performance of mustard and toria varieties in Kamrup district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties used in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Kamrup	DRMR 150-35	55	1450 (1100-1785)	856 (710-1120)	69.39	27738	24958	79025	46652	29593	2.84	1.86
	PM-28	25	1427 (1201-1650)	887 (740-980)	6087	27505	24868	77772	48342	26793	2.82	1.94
	TS-38	41	993 (862-1400)	769 (591-900)	29.12	27496	25328	54119	41911	10040	1.96	1.65
Rainfed condition												
Kamrup	DRMR 150-35	24	1075 (862-1400)	670 (524-890)	60.44	24051	21989	58588	36515	20011	2.43	1.66
	PM-28	75	1070 (850-1350)	691 (522-950)	54.84	23958	21983	58315	37660	18680	2.43	1.71
	TS-38	177	903 (713-1250)	676 (514-920)	33.57	23685	21659	49214	36842	10346	2.07	1.70

Table 9a: Performance of different varieties in crop demonstrations (CD) conducted in Kokrajhar district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Kokrajhar	DRMR-150-35 NRCHB 101, PM-28	37	1122 (835-1310)	721 (600-870)	55.61	32061	23127	61149	39295	12920	1.90	1.69
Overall IR CD in Kokrajhar	**DRMR-150-35 NRCHB 101, PM-28**	**37**	**1122 (835-1310)**	**721 (600-870)**	**55.61**	**32061**	**23127**	**61149**	**39295**	**12920**	**1.90**	**1.69**
Rainfed condition												
Kokrajhar	DRMR-150-35 NRCHB 101, PM-28	129	932 (710-1200)	681 (530-890)	36.85	26360	20860	50794	37115	8179	1.92	1.77
	TS-38	120	914 (705-1200)	678 (545-820)	34.80	26224	20567	49813	36951	7205	1.89	1.79
Overall RF CD in Kokrajhar	**DRMR-150-35, PM-28 NRCHB 101, TS-38**	**249**	**924 (705-1200)**	**679 (530-890)**	**36.08**	**26295**	**20719**	**50358**	**37006**	**7776**	**1.91**	**1.78**
Overall CD in Kokrajhar	**All varieties in both situations**	**286**	**949 (705-1200)**	**685 (530-890)**	**38.54**	**27044**	**21037**	**51721**	**37333**	**8381**	**1.91**	**1.77**

Table 9b: Average performance of mustard and toria varieties in Kokrajhar district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Kokrajhar	DRMR-150-35	11	1138 (920-1255)	715 (620-870)	59.16	32278	22977	62021	38968	13054	1.92	1.69
	PM-28	16	1117 (835-1290)	720 (600-830)	55.13	31650	23292	60877	39240	13279	1.92	1.68
	NRCHB-101	10	1112 (910-1310)	731 (620-845)	52.12	32480	23027	60604	39840	11311	1.86	1.73
Rainfed condition												
Kokrajhar	PM-28	53	956 (745-1200)	710 (530-890)	34.64	26438	20947	52102	38695	7916	1.97	1.84
	NRCHB-101	37	922 (725-1200)	663 (545-820)	39.06	26316	20948	50249	36134	8447	1.90	1.72
	DRMR-150-35	39	909 (710-1150)	657 (540-790)	38.35	26296	20657	49541	35807	8095	1.88	1.73
	TS-38	120	914 (705-1200)	678 (545-820)	34.80	26224	20567	49813	36951	7205	1.89	1.79

Table 10a: Performance of different varieties in crop demonstrations (CD) conducted in Lakhimpur district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Lakhimpur	TS-38	185	1081 (423-1370)	759 (380-1002)	42.42	23852	20618	58915	41366	14315	2.47	2.00
	DRMR-150-35 NRCHB 101, PM-28	265	1005 (380-1894)	712 (320-1245)	41.15	23763	20614	54773	38804	12820	2.30	1.88
Overall RF CD in Lakhimpur	**All varieties in rainfed situation**	**500**	**1024 (380-1894)**	**724 (320-1245)**	**41.43**	**23785**	**20615**	**55808**	**39458**	**13180**	**2.34**	**1.91**

Table 10b: Average performance of mustard and toria varieties in Lakhimpur district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Lakhimpur	TS-38	185	1081 (423-1370)	759 (380-1002)	42.42	23852	20618	58915	41366	14315	2.47	2.00
	DRMR-150-35	110	1047 (452-1894)	736 (412-1245)	42.25	23887	20807	57062	40112	13870	2.38	1.92
	PM-28	155	998 (421-1362)	709 (422-965)	40.76	23690	20529	54391	38641	12589	2.29	1.88
	NRCHB-101	50	971 (380-1325)	693 (320-952)	40.11	23714	20506	52920	37769	11943	2.23	1.84

Table 11a: Performance of different varieties in crop demonstrations (CD) conducted in Morigaon district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg/ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B:C Ratio (GMR/COC)	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Morigaon	TS-38	100	1037 (850-1500)	685 (307-990)	51.38	24754	21479	56617	37333	16009	2.28	1.73
	DRMR-150-35 PM-28	100	886 (497-1500)	575 (307-990)	54.08	23669	21027	48287	31338	14307	2.04	1.49
Overall CD in Morigaon	**All varieties in rainfed situation**	**200**	**936 (497-1500)**	**612 (307-990)**	**52.94**	**24031**	**21178**	**51012**	**33354**	**14805**	**2.12**	**1.57**

Table 11b: Performance of mustard and toria varieties in Morigaon district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg/ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B:C Ratio (GMR/COC)	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Morigaon	TS-38	100	1037 (850-1500)	685 (307-990)	51.38	24754	21479	56617	37333	16009	2.28	1.73
	PM-28	50	1016 (815-1500)	656 (416-965)	54.87	24029	21426	55372	35752	17017	2.30	1.66
	DRMR-150-35	50	756 (497-1200)	495 (354-750)	52.72	23309	20628	41202	26978	11543	1.76	1.30

Table 12a: Performance of different varieties in crop demonstrations (CD) conducted in Nagaon district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Nagaon	DRMR-150-35 NRCHB 101, PM-28	77	1250 (850-1830)	839 (570-1075)	48.98	29781	25725	68125	45726	18343	2.28	1.77
	TS-38	29	1159 (850-1390)	832 (660-940)	39.30	25000	22305	63166	45344	15127	2.52	2.03
Overall IR CD in Nagaon	PM-28, NRCHB 101 DRMR 150-35, TS-38	106	1225 (850-1830)	837 (570-1075)	46.40	28474	24789	66763	45617	17461	2.34	1.84
Rainfed condition												
Nagaon	TS-38	102	951 (540-1272)	671 (308-900)	41.17	20553	17635	51830	36570	12342	2.52	2.07
	DRMR-150-35 NRCHB 101, PM-28	175	856 (365-1260)	621 (305-925)	37.84	22802	19863	46652	33845	9868	2.04	1.70
Overall RF CD in Nagaon	**PM-28, NRCHB 101 DRMR 150-35, TS-38**	**277**	**891 (365-1272)**	**640 (305-925)**	**39.21**	**21974**	**19042**	**48560**	**34880**	**10748**	**2.20**	**1.83**
Overall CD in Nagaon	**All varieties in both situations**	**383**	**983 (365-1830)**	**694 (305-1075)**	**41.64**	**23773**	**20633**	**53574**	**37823**	**12611**	**2.25**	**1.83**

Table 12b: Average performance of mustard and toria varieties in Nagaon district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Nagaon	PM-28	34	1330 (970-1830)	864 (710-1070)	53.93	30086	25343	72485	47088	20654	2.40	1.85
	NRCHB-101	19	1236 (920-1530)	822 (570-960)	50.36	29788	25384	67362	44799	18159	2.26	1.76
	TS-38	29	1159 (850-1390)	832 (660-940)	39.30	25000	22305	63166	45344	15127	2.52	2.03
	DRMR-150-35	24	1149 (880-1640)	818 (615-1075)	40.46	29346	26538	62621	44581	15232	2.13	1.67
Rainfed condition												
Nagaon	PM-28	57	979 (635-1260)	678 (520-925)	44.39	24217	20748	53356	36951	12936	2.20	1.78
	TS-38	102	951 (540-1272)	671 (308-900)	41.17	20553	17635	51830	36570	12342	2.52	2.07
	DRMR 150-35	72	810 (540-1117)	614 (328-795)	31.92	22134	19216	44145	33463	7764	1.99	1.74
	NRCHB-101	46	774 (365-1250)	562 (305-835)	37.72	22096	19779	42183	30629	9237	1.90	1.54

Table 13a: Performance of different varieties in crop demonstrations (CD) conducted in Nalbari district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Nalbari	DRMR-150-35, PM-28	52	1117 (615-1580)	658 (395-875)	69.75	28879	22561	60877	35861	18698	2.10	1.58
Rainfed condition												
Nalbari	DRMR-150-35, PM-28	45	945 (570-1420)	602 (410-715)	56.97	2654	22046	51503	32809	14286	1.90	1.48
	TS-38	96	854 (610-1110)	595 (320-820)	43.52	26348	21614	46543	32428	9381	1.76	1.50
Overall RF CD in Nalbari	**DRMR-150-35, PM-28, TS-38**	**141**	**883 (570-1420)**	**597 (320-820)**	**47.90**	**26382**	**21916**	**48124**	**32537**	**11121**	**1.82**	**1.48**
Overall CD In Nalbari	**All varieties in both situations**	**193**	**946 (570-1580)**	**614 (320-875)**	**54.07**	**27055**	**21952**	**51557**	**33463**	**12991**	**1.90**	**1.52**

Table 13b: Average performance of mustard and toria varieties in Nalbari district of Assam under irrigated and rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Irrigated condition												
Nalbari	DRMR-150-35	10	1281 (1040-1580)	725 (660-840)	76.68	27745	23660	69815	39513	26217	2.51	1.67
	PM-28	42	1078 (615-1450)	643 (395-875)	67.65	29149	21661	58751	35044	16219	2.01	1.61
Rainfed condition												
Nalbari	PM-28	15	1014 (650-1420)	608 (410-715)	66.77	26182	20952	55263	33136	16897	2.11	1.58
	DRMR-150-35	30	910 (570-1200)	599 (470-715)	51.91	26590	23365	49595	32646	13724	1.86	1.39
	TS-38	96	854 (610-1110)	595 (320-820)	43.52	26348	21614	46543	32428	9381	1.76	1.50

Table 14a: Performance of different varieties in crop demonstrations (CD) conducted in Sivasagar district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Sivasagar	TS-38	99	871 (515-1141)	534 (345-685)	63.10	29800	23000	47470	29103	11567	1.52	1.26
	DRMR-150-35 PM-28	94	866 (570-1166)	553 (349-694)	56.60	31027	23312	47197	30139	9943	1.52	1.29
Overall RF CD in Sivasagar	**All varieties in rainfed situation**	**193**	**869 (570-1166)**	**544 (349-694)**	**59.74**	**30397**	**23152**	**47361**	**29648**	**10468**	**1.55**	**1.28**

Table 14b: Average performance of mustard and toria varieties in Sivasagar district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Sivasagar	PM-28	49	899 (695-1166)	565 (420-694)	59.11	30500	23140	48996	30793	10843	1.6	1.33
	DRMR-150-35	45	833 (570-1095)	541 (349-675)	53.97	31600	23500	45399	29485	7814	1.43	1.25
	TS-38	99	871 (515-1141)	534 (345-685)	63.10	29800	23000	47470	29103	11567	1.59	1.26

Table 15a: Performance of different varieties in crop demonstrations (CD) conducted in Sonitpur district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Sonitpur	DRMR-150-35 NRCHB-101 PM-28	314	1078 (925-1210)	754 (670-842)	42.97	28228	21646	58751	41093	11076	2.08	1.89
	TS-38	168	1089 (890-1290)	754 (670-870)	44.42	28223	21617	59351	41093	11652	2.10	1.90
Overall CD in Sonitpur	**All varieties in rainfed situation**	**482**	**1085 (890-1360)**	**755 (670-870)**	**43.70**	**28224**	**21641**	**59133**	**41148**	**11402**	**2.09**	**1.90**

Table 15b: Average performance of mustard and toria varieties in Sonitpur district of Assam under rainfed situation during 2022-23 under ICAR-DRMR-OPIU (APART) project

Name of District	Varieties in IP	No. of CD	Yield (kg /ha)		YIOFP (%)	COC (Rs/ha)		GMR (Rs/ha)		ANMR (Rs/ha)	B: C Ratio GMR/CoC	
			IP	FP		IP	FP	IP	FP		IP	FP
Rainfed condition												
Sonitpur	NRCHB-101	97	1093 (965-1200)	758 (670-829)	44.19	28231	21648	59569	41311	11675	2.11	1.90
	DRMR-150-35	78	1085 (946-1210)	760 (685-842)	42.76	28240	21591	59133	41420	11073	2.09	1.91
	TS-38	168	1089 (890-1290)	754 (670-870)	44.42	28223	21617	59351	41093	11652	2.10	1.90
	PM-28	139	1064 (925-1182)	748 (670-837)	42.24	28220	21674	57988	40766	10676	2.05	1.88