

# Pulse Rejuvenation in Eastern India through Cluster Frontline Demonstration

## Annual Report 2021-22



ICAR-Agricultural Technology Application Research Institute Kolkata

Salt Lake, Kolkata- 700 097



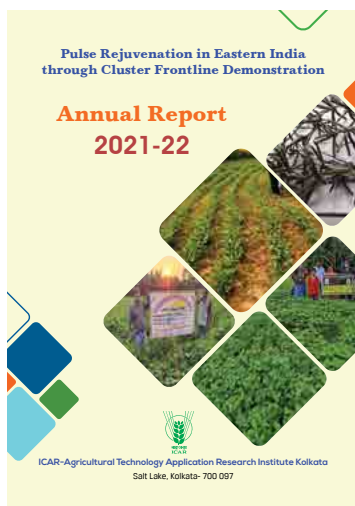
# **Pulse Rejuvenation in Eastern India through Cluster Frontline Demonstration**

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All 32 KVKs implementing CFLD Pulses 2021-22

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## Foreword

Consumed as dal, pulses are a cheap source of protein security in India and have the ability to revitalise the soil through symbiotic nitrogen fixation. They are the second-most important agricultural crop after cereals and are crucial to India's food and nutritional security. These legumes are eaten because they contain a variety of amino acids and have several therapeutic benefits. India contributes between 25 and 27 per cent of the world's production and consumption of pulses, respectively. However, the country faces a substantial gap between the supply and demand for pulses. There is a tremendous opportunity to significantly increase the output of pulses in India, largely by raising productivity and, to a lesser extent, by expanding the area planted with pulses. The production of pulses climbed by 51.81 per cent, from 18.24 million tonnes in 2010–11 to a record 27.69 million tonnes in 2021–22. The increase in production of pulses during the period was accompanied by decrease in import of pulses. Department of Agriculture and Farmers Welfare (DA&FW, GoI) under National Food Security Mission (NFSM) aims to increase pulse production through productivity as well as area expansion; create employment opportunities; and enhance the farm profits to enhance farmers' trust. In this endeavour, the DA&FW sanctioned the "Cluster Frontline Demonstration on Pulses" project in 2015 (rabi) involving ICAR/KVK to provide seeds of improved varieties and to disseminate improved technologies generated by State Agricultural Universities, ICAR Institutes and Non-governmental Organizations. In 2021-22, NFSM provided Rs. 40.587 lakh for the project to ICAR-ATARI Kolkata, Zone-V, during May, 2021. The fund was used to conduct CFLDs through 32 Krishi Vigyan Kendras (KVKs) in the states of Odisha, West Bengal, and the Union Territory of the A&N Islands.

The publication "*Pulse rejuvenated in Eastern India through Cluster Frontline Demonstration*" embodies a detailed report on the CFLD 2021-22 conducted in Zone V. I am confident that the success stories in the report will form a valuable addition to the existing body of inspiration. I extend my sincere gratitude to DA&FW- NFSM and ICAR Headquarters for providing funds for the project. I am highly thankful to Directors of Extension Education of various State Agricultural Universities, Nodal Scientist at ICAR-ATARI, Senior Scientists & Head and Nodal Officers of KVKs, and the farmers whose combined efforts made the project a success. I whole-heartedly congratulate everyone who was part of this great initiative.

Kolkata

29<sup>th</sup> May, 2023

(Pradip Dey)



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## 1. INTRODUCTION

In India pulses are consumed equally by rich and poor. Pulses are considered as an important and less expensive sources of protein (Mohanty and Satyasai 2015). The amount of protein in pulses is 17 per cent to 35 per cent on a dry weight basis (Boye, Zare, and Pletch 2010). More than 89 per cent of consumers eat pulses at least once a week, while the corresponding number for eating fish or chicken/meat once a week is only 35.4 per cent (IIPS and ORC Macro 2007). Pulses complement the staple cereals in people's diets with proteins, essential amino acids, vitamins, and minerals. They contain 22 per cent to 24 per cent protein, almost twice the amount of protein found in wheat and three times that found in rice. Pulses are high in fiber, relatively low in energy density (1.3 kcal per gram), and a good source of digestible protein (average of 7.7 grams of protein per half cup). Pulse carbohydrates are slowly digested (McCrary et al. 2010). Legumes fix atmospheric nitrogen in readily available form to the upcoming succeeding crop. Associated non legume intercrop also gets benefited by 'N' transfer from legume roots up to some extent. It also contributes to sustain production system through physical, chemical and biological improvements of soil properties, as a rotation effect (Malo, M and Hore, J 2020).

India is the largest producer, consumer, and importer of the pulses in the world. It produced about 27.3 million metric tonnes pulses in 2021-22. Despite being the leading producer of pulses, India has been consistently unable to meet its own domestic demand of pulses. India imported around 2.4 million tonnes during 2020-21 (DES) to meet its ever-increasing consumption needs. Every year India is importing pulses worth 10 to 11 thousand crore rupees to meet the increasing demand of pulses (DGCI&S).

According to the Vision-2030 document prepared by the ICAR-Indian Institute of Pulses Research (IIPR), Kanpur, a growth rate of 4.2% has to be ensured in order to meet the projected demand of 32 million tonnes of pulses by 2030. The targeted production and productivity is possible by way of reducing the yield gap by growing pulses in new niches, precision farming, quality inputs, soil test based integrated nutrient management and mechanized method of pulse cultivation complimented with generous governmental policies and appropriate funding support to implementing states/stake holders (Tiwari and Shivhare, 2017).

Pulses, therefore, have always received due attention both in terms of requirement by consumers and adequate programmatic support from the government at the production front. Addressing this concern of significance, the Ministry of Agriculture and Farmers Welfare, Govt. of India initiated a nation-wide cluster frontline demonstration (CFLD) programme on pulses under National Food Security Mission-Pulses (NFSM-Pulses) during 2015-16. The basic strategy of the mission is to promote and extend improved technologies, *i.e.*, seed, micro-nutrients, soil amendments, integrated pest management, farm machinery and implements, irrigation devices along with capacity building of farmers.

To increase area under pulses cultivation and total production through achieving better productivity, Department of Agriculture & Farmers Welfare (DA& FW), Ministry of Agriculture and Farmers Welfare (MoA&FW) sanctioned the project "**Cluster Frontline Demonstration on Pulses**" during *rabi* 2015 to 11 ATARIs, which was continued with fresh sanction in the year 2021-22. The



project is funded under National Food Security Mission (NFSM). The sanctioned amount of Rs. 19620800/-to ICAR-ATARI, Zone V, Kolkata for conducting cluster frontline demonstration (CFLDs) in the states of Odisha and West Bengal and Union Territory of A& N Islands was received from NFSM.

In West Bengal pulses are grown in an area about 4.65 lakh ha (2020-21) with a production of 4.42 lakh tonnes. Around 7.78 lakh ha area is under pulses in Odisha, however, the yield of pulses (554 kg/ha) is below the national average (885 kg/ha,2020-21). Pulses are grown in marginal area of 650 ha in the Union Territory of A&N Islands with total production of 260 tonnes. The average yield of pulses in the Union Territory is 400 kg/ha which is far below the national average yield (2020-21).

CFLDs were conducted by 32 *Krishi Vigyan Kendras* (KVKs) during 2021-22 on pigeonpea, greengram (*kharif* & summer) and blackgram (*kharif* & summer). The demonstration of pulses was organized in cluster approach covering at least 10ha area. Improved varieties of less than 10 years were included in the demonstrations. The entire project was monitored by ICAR-ATARI, Kolkata, SAUs and other concerned Departments.



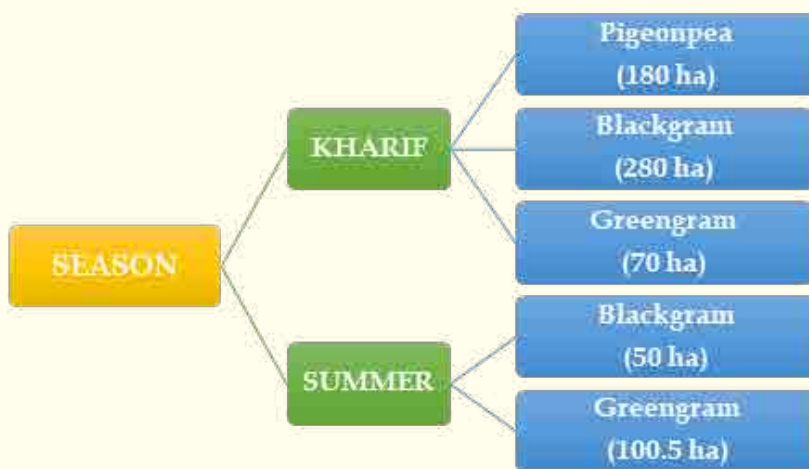
## 2. CFLD at a Glance in Zone v (2021-22)

### OBJECTIVES

- To increase area under pulses cultivation
- To increase pulses production for better productivity
- To promote new varieties
- To promote new agro technologies
- To improve the socio-economic condition of the farmers

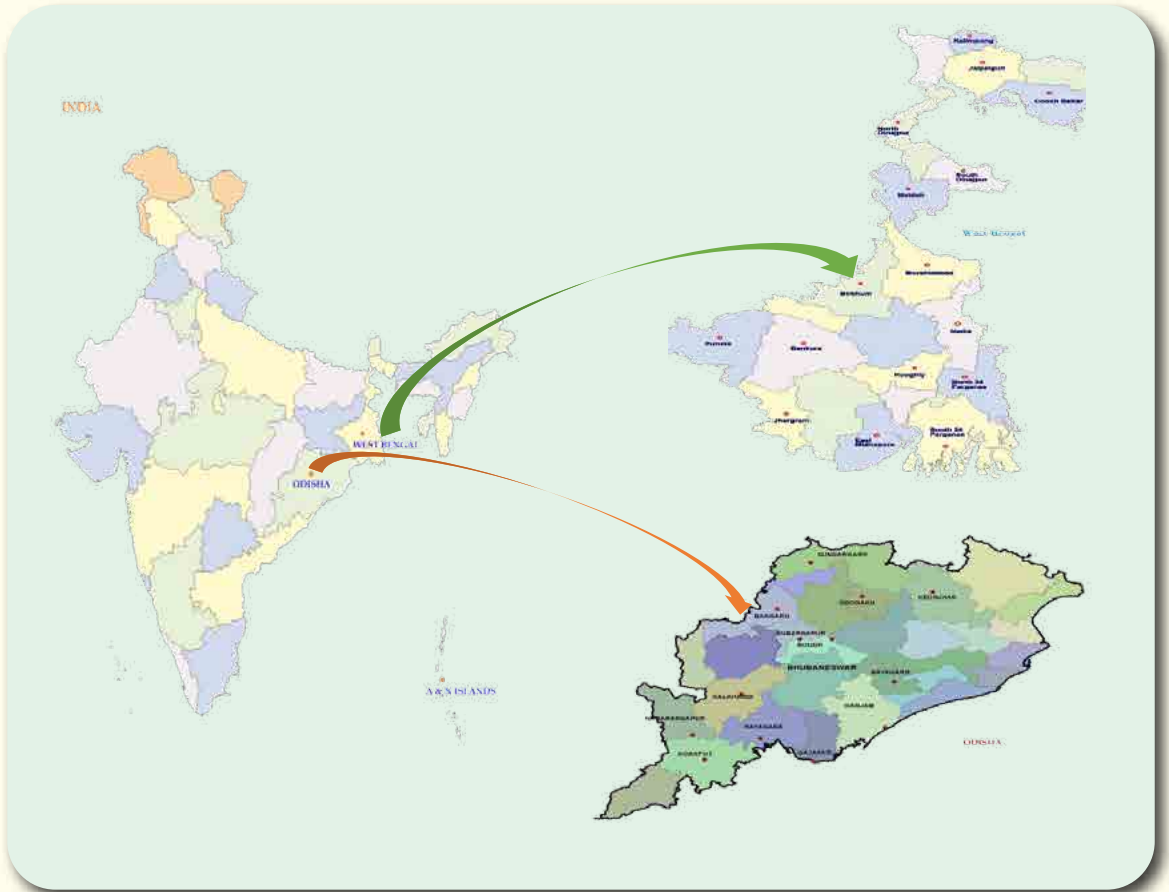


### Crop Demonstration



### Area of operation under this Zone

Odisha	West Bengal	A & N Islands
<b>Pigeonpea:</b> Bargarh, Boudh, Deogarh, Gajapati, Kalahandi, Keonjhar, Koraput, Nayagarh	<b>Pigeonpea:</b> Jhargram, Purulia, Murshidabad (Addl) <i>Sargachi</i>	<b>Greengram (Summer):</b> N&M Andamans
<b>Blackgram (Kharif):</b> Keonjhar, Nabarangapur, Rayagada, Sundargarh-II, Rayagada	<b>Blackgram (Kharif):</b> Bankura, Birbhum, Coochbehar, D. Dinajpur, Jalpaiguri, Malda, Nadia, Murshidabad, North 24 Parganas, Purba Medinipur, Purulia, Uttar Dinajpur, Murshidabad (Addl)	
<b>Greengram (Kharif):</b> Boudh, Ganjam-II, Sonapur	<b>Greengram (Kharif):</b> Kalimpong, Purulia, Murshidabad(Addl)	
	<b>Blackgram (Summer):</b> Birbhum, Murshidabad, Murshidabad(Addl)	
	<b>Greengram (Summer):</b> Birbhum Hooghly, Howrah, South 24 Parganas, Nimpith, Uttar Dinajpur	



**West Bengal  
(1811)**

**Odisha  
(547)**

**A & N Islands  
(03)**

**No. of Farmers Involved**



## TECHNOLOGY

Improved varieties: PGR-176, BRG-5, Laxmi, VallabhUrd -I, RU-03-04, Indira, PU 31, IPU-02-43, IPM-02-14,

Line sowing

Use of bio fertilizers for seed inoculation

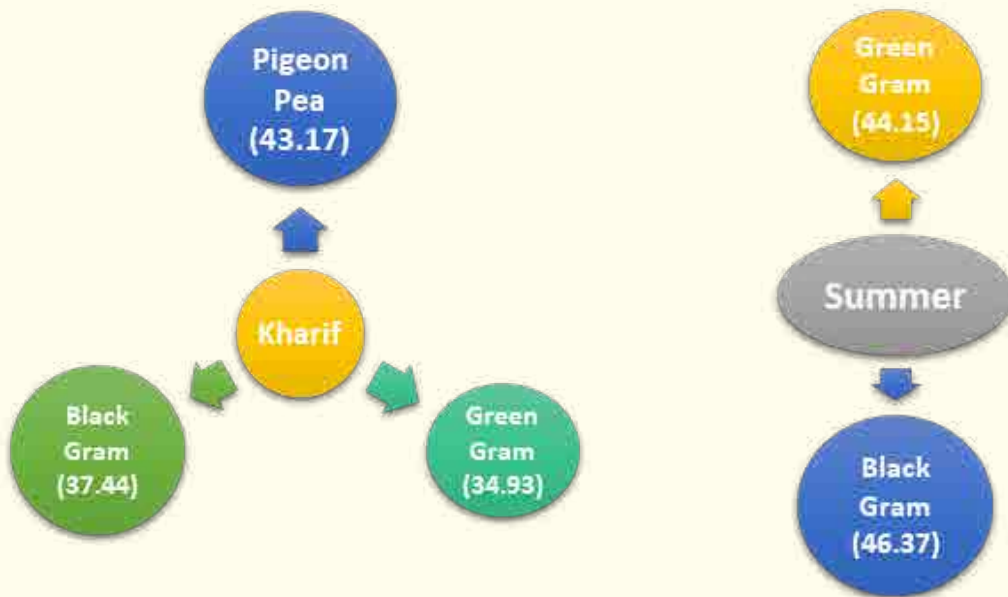
Varietal replacement

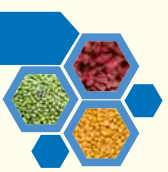
Integrated nutrient management

Integrated pest & disease management

## IMPACT OF TECHNOLOGIES

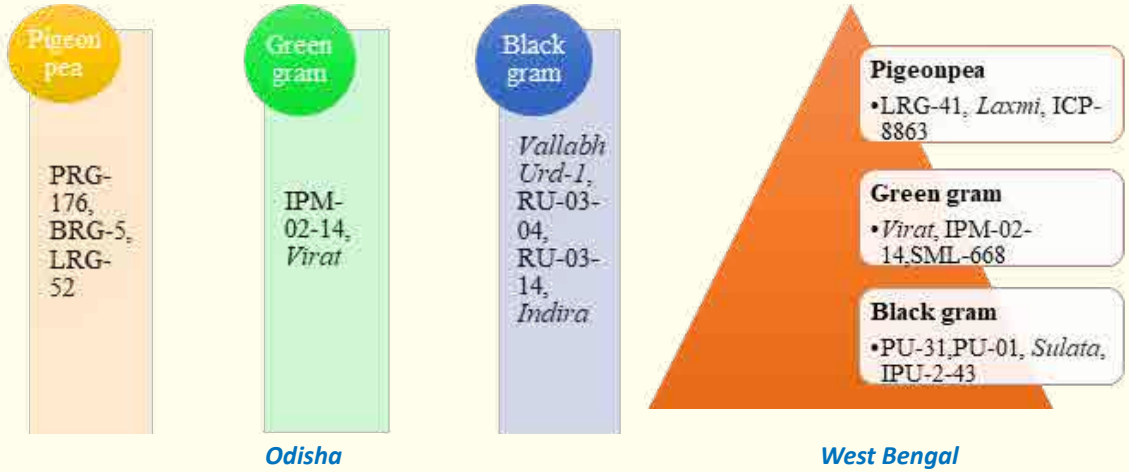
Yield increase (%) over farmers' practice





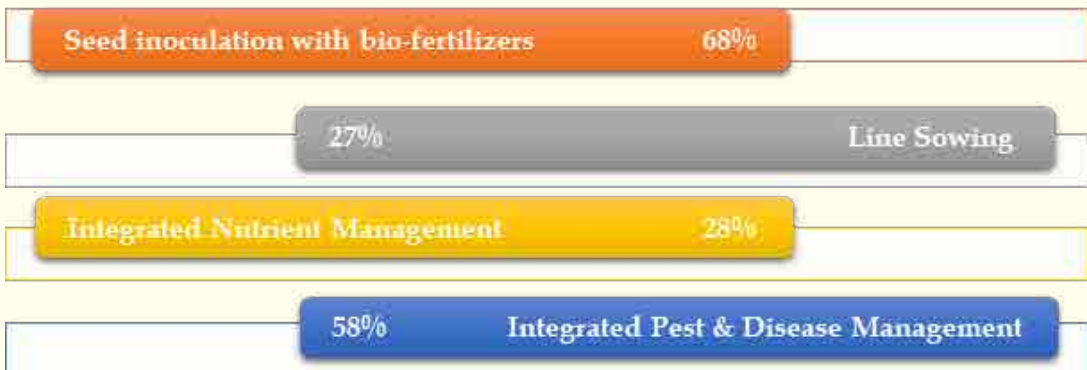
## Interventions executed through CFLD...

### Crop-wise variety demonstration:

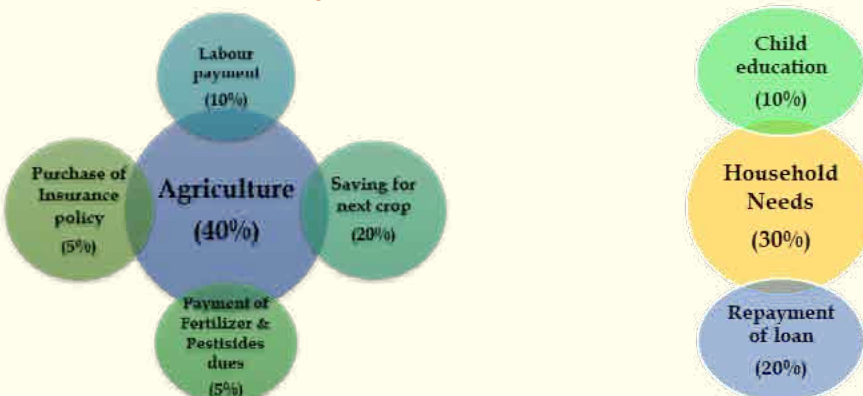


### Demonstration of Improved cultivation practices:

Based on the information provided by the KVKs, different interventions were carried out in farmers' field for CFLD. Out of which seed inoculation with bio fertilisers was practice by 68 per cent of the farmer followed by IPM and IDM (58%), INM (28%) and line sowing (27%).

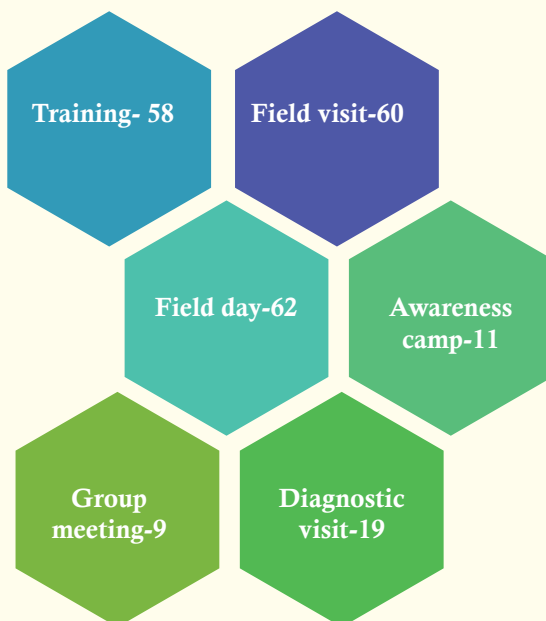


### Utilization of income by famers:





## Extension activities:





### 3. Area, Production and Yield of different pulses

#### 3. a. ODISHA

**Pigeonpea:** The average area of pigeonpea in the state is about 1.35 lakh ha with the average production of 1.37 lakh tonnes. During the last five years (2016-17 to 2020-21) yield has shown positive trend as reflected from fig 1. The yield of pigeonpea in the state (1166 kg/ha) is higher than the national average 877kg/ha (average of last 5 years).

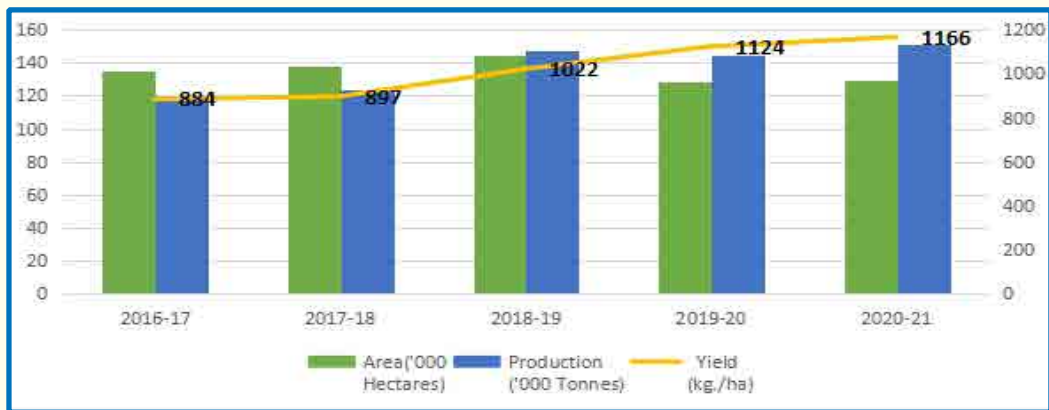


Fig 1: Area, Production & Yield of pigeonpea in Odisha

**Blackgram:** The average area of blackgram in the state is about 0.75 lakh ha that gives production of 0.28 lakh tonnes with yield of 383 kg/ha. (average of last five years). From fig-2, it is observed that the area under blackgram has drastically decreased during 2018-19 and 2019-20, however, the area increased again during 2020-21. The yield also fluctuated during the last five year.

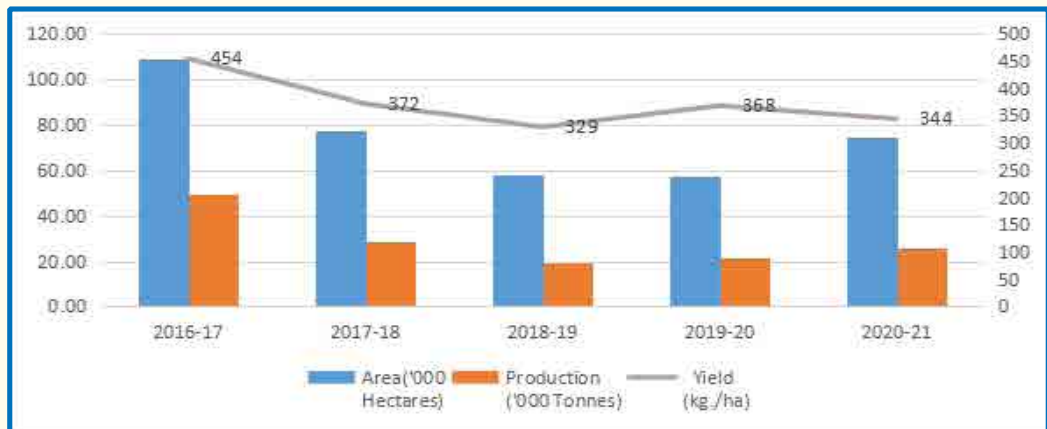


Fig 2: Area, Production & Yield of blackgram in Odisha





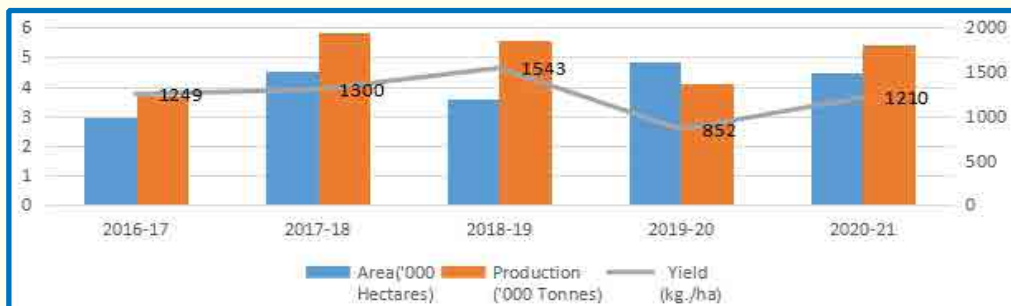
**Greengram:** Average area under greengram in the state is 2.51 lakh ha with production of 0.87 lakh tonnes. The yield of greengram in the state has fall in from 410 kg/ha (2016-17) to 246 kg/ha (2020-21). The state yield of greengram is below the national average yield of 531kg/ha.



*Fig 3: Area, Production &Yield of greengram in Odisha*

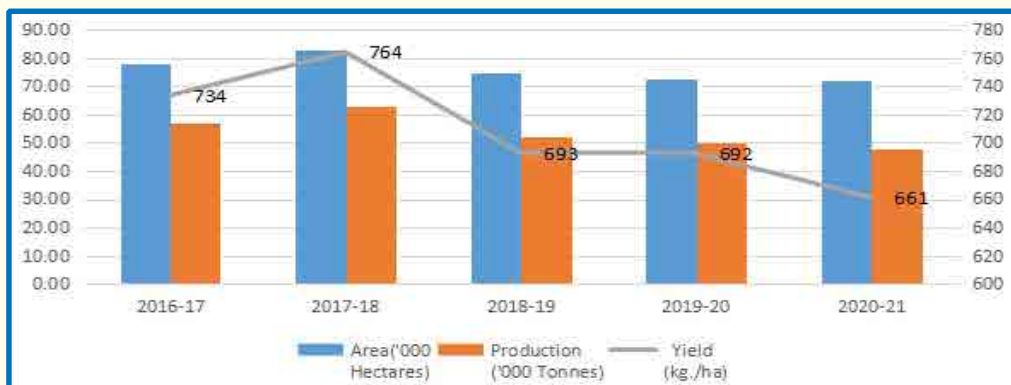
### 3. b. WEST BENGAL

**Pigeonpea:** The state has marginal area under pigeonpea. The area under the crop has increased from 3000 ha (2016-17) to 4500 ha (2020-21). The average yield of pigeonpea in the state is 1231 kg/ha which is higher than the average national yield 877 kg/ha (2016-17 to 2020-21).



*Fig 4: Area, Production &Yield of pigeonpea in West Bengal*

**Blackgram:** The average area of blackgram in the state is 0.75 lakh hectares and production is 0.53 lakh tones with average yield of 710 kg /ha (2016-17 to 2020-21). From fig-5, it is observed that the area and production under blackgram is at par during the last five year but the yield is in decrease trend.

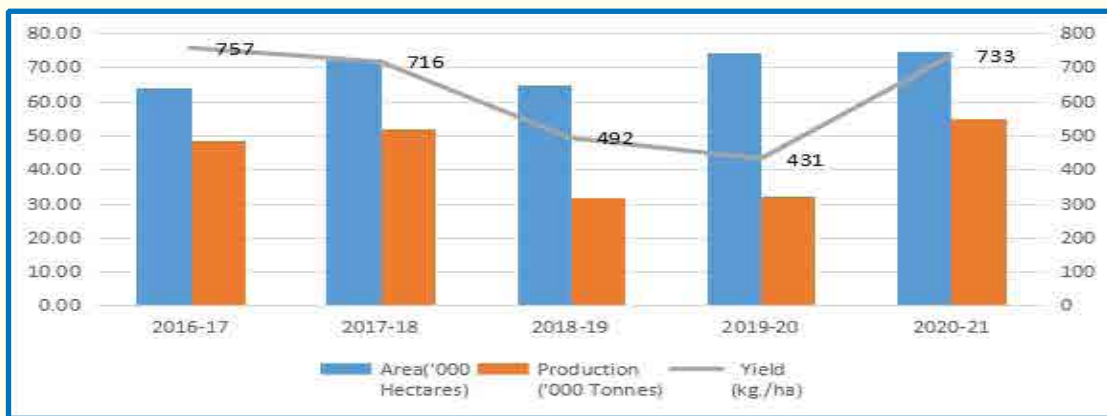


*Fig 5: Area, Production &Yield of blackgram in West Bengal*

Source:-DES, Ministry of Agriculture and FW



**Greengram:** In West Bengal, the average area of greengram is 0.71 lakh hectares and production of 0.43 lakh tonnes. The state average yield is 625kg /ha (2016-17 to 2020-21) which is higher than the national average (531 kg/ha).It is observed from fig 6 that the area under greengram is in increasing trend.



Source:-DES, Ministry of Agriculture and FW

**Fig 6: Area, Production &Yield of greengram in West Bengal**

### 3. c. ANDAMAN AND NICOBAR ISLANDS

**Greengram:** Greengram grows on an average of 200 hectares in the Union Territory and it produces 0.077 thousand tonnes, with an average yield of 385 kg/ha (2016-17 to 2020-21).



Source:-DES, Ministry of Agriculture and FW

**Fig 7: Area, Production &Yield of greengram in A&N Islands**



## 4. Overview of Cluster Frontline Demonstration (CFLD) on pulses during 2021-22

During 2021-22, ICAR-ATARI, Kolkata (Zone-V) was allotted a target of 1775 number of Cluster Frontline Demonstrations (CFLD-Pulses) to cover an area of 710 ha. CFLDs were conducted by thirty two (32) KVKs *i.e* thirteen (13) KVKs of Odisha, eighteen (18) KVKs of West Bengal and one KVK of A&N Islands according to the agro-ecological condition. Of the total target 1701 number of demonstrations was achieved covering a total area of 680.5 ha. The crop-wise and state-wise details of the number of demonstrations and area under CFLD *khari*f and summer are indicated in table 1a & b. Total number of farmers involved for conducting demonstration was 2361 (Table -2).

**Table1: a. Total area covered under CFLD Pulses (*Khari*f) 2021-22**

Sl. No	Crops	State	Target of FLDs approved		Achievements of FLDs	
			No.	Area (ha)	No.	Area (ha)
1	Blackgram	West Bengal	575	230	575	230
		Odisha	125	50	125	50
2	Greengram	West Bengal	75	30	75	30
		Odisha	100	40	100	40
3	Pigeonpea	West Bengal	75	30	75	30
		Odisha	375	150	375	150
<b>Total area (<i>khari</i>f)</b>			<b>1325</b>	<b>530</b>	<b>1325</b>	<b>530</b>

**Table1:b. Total area covered under CFLD Pulses (Summer) 2021-22**

Sl. No	Crops	State	Target of FLDs approved		Achievements of FLDs	
			No.	Area (ha)	No.	Area (ha)
1	Blackgram	West Bengal	125	50	125	50
		A&N Islands	25	10	0	0
2	Greengram	West Bengal	250	100	250	100
		A&N Islands	50	20	1.25	0.5
<b>Total area (summer)</b>			<b>450</b>	<b>180</b>	<b>376.25</b>	<b>150.5</b>

**Table 2. State wise involvement of farmers in demonstration**

Sl. No.	State	Area (ha)	No. of farmers
1	Odisha	240	547
2	West Bengal	440	1811
3	A&N Islands	0.5	03
	<b>Total</b>	<b>680.5</b>	<b>2361</b>



## 5. CFLD on pulses during *Kharif* 2021

### 5. a. Odisha

#### (i) Pigeonpea:

CFLDs on pigeonpea were conducted in an area of 150 ha by nine (09) *Krishi Vigyan Kendra* (KVKs) of Odisha. The average demonstrated yield recorded was 11.89q/ha with yield increase 36.04 per cent in comparison to farmers existing yield (8.74q/ha). The varieties of pigeonpea like PRG 176, LRG-52, and BRG 5 were demonstrated.

#### Varietal Performance of Pigeonpea

CFLDs on pigeonpea variety PRG 176 was conducted in an area of 90 ha through KVKs in six (06) districts of Odisha viz. Bargarh, Boudh, Deogarh, Keonjhar, Nayagarh and Rayagada during *Kharif* 2021. The various technologies like seed treatment with *Rhizobium* and chemicals, line sowing, soil and foliar application of micronutrients, use of pre and post herbicide and release of *Trichogramma chilonis* with need based plant protection measures were practiced by the farmers. Table 3 indicates that PRG 176 variety showed 39.77 per cent yield increase over check. CFLDs of pigeonpea gave 73 per cent increase of net returns. In addition, another two varieties namely, LRG-52 and BRG-5 were demonstrated in 40 and 20 ha, respectively. As compared to the control plot, the average exhibited yield of LRG-52 ranges from 12.02 to 14.2 q/ha, while it is between 9.7 to 10.2 q/ha in respect of BRG 5. The net return of the demo was 55 per cent higher than the check plot. The yield of BGR-5 in demonstration plot was 11.03 q/ha whereas in check plot it was 8.1 q/ha and the net return was 66 per cent high over check. The demo benefit -cost ratio (BCR) of PRG-176, LRG-52 and BRG-5 was at par (2.1).

**Table 3: CFLDs on Pigeonpea under NFSM during *kharif* 2021-22 in Odisha**

Sl. No.	Name of the KVK/ Districts	Name of variety demonstrated	Achievement		Average yield (q/ha)			Net returns (Rs./ha)			Diff. of yield btw demo & check (q/ha)	Demo BCR
			Demo no.	Area (ha)	Demo	Check	% increase	Demo	Check	% increase		
1	Bargarh	PRG-176	50	20	9.52	5.76	65.19	26580	15900	67.17	3.76	1.41
2	Boudh	PRG-176	50	20	12.90	9.50	35.79	27400	20550	33.33	3.40	2.10
3	Deogarh	PRG-176	50	20	10.24	7.60	34.74	43320	24500	76.82	2.64	2.38
4	Keonjhar	PRG-176	25	10	8.80	7.30	20.55	28180	20150	39.85	1.50	2.02
5	Nayagarh	PRG 176	25	10	12.52	9.13	37.13	49398	23754	107.96	3.39	2.11
6	Rayagada	PRG 176	25	10	14.50	9.70	49.48	56860	29110	95.33	4.80	2.59
Total /Average			225	90	11.41	8.17	39.77	38623	22327	72.99	3.25	2.10
1	Koraput	LRG-52	50	20	14.2	9.70	46.39	48200	25900	86.10	4.50	2.3
2	Kalahandi	LRG-52	50	20	12.2	10.20	19.61	44900	34200	31.29	2.00	2.1
Total /Average			100	40	13.2	9.95	32.66	46550	30050	54.91	3.25	2.2
1	Gajapati	BRG-5	50	20	11.05	8.10	36.42	29550	16720	76.73	2.95	2.15
<b>Grand Total/ Average</b>			<b>375</b>	<b>150</b>	<b>11.89</b>	<b>8.74</b>	<b>36.04</b>	<b>38241</b>	<b>23032</b>	<b>66.03</b>	<b>3.15</b>	<b>2.15</b>



## Photographs of Pigeonpea



*KVK Kalahandi*



*KVK Gajapati*



*KVK Boudh*



*KVK Nayagarh*

### (ii) Blackgram

A total of 125 number of demonstration on blackgram was conducted in an area of 50 ha by four (4) KVKs of Odisha viz. Keonjhar, Nabarangapur, Rayagada and Sundargarh-II. From the table 4, it is observed that the average demonstration yield was 6.83 q/ha, which is a 35.82 percent more over the farmers' yield of 5.03 q/ha. Between demo and check, average yield differ by 1.8 q/ha.

### Varietal Performance of Blackgram

CFLDs on blackgram varieties viz *VallabhUrd-1*, RU 03-04, RU-03-14 and *Indira* were demonstrated in an area of 50 ha through *Krishi Vigyan Kendras*. The demonstration was conducted on various technologies like seed treatment, integrated nutrient management, integrated pest management etc. Variety RU-03-14 recorded 44.9 per cent increase of yield over the check. The average yield of RU-03-14 in the demo plot was 7.45 q/ha whereas in check plot it was 5.5q/ha with BCR of 2.5. The yield of *Vallabh Urd-1* in the demo plot was 5.65q/ha which is 34 per cent over check. In comparison to other two varieties, *Indira* variety of blackgram recorded an increase in net return of 85.45 per cent with BCR of 1.84.



**Table 4: CFLDs on Blackgram under NFSM during *kharif* 2021-22 in Odisha**

Sl. No.	Name of the KVK/ Districts	Name of variety demonstrated	Achievement		Average yield (q/ha)			Net returns (Rs./ha)			Diff. of yield btw demo & check (q/ha)	Demo BCR
			De-mo-no.	Area (ha)	Demo	Check	% increase	Demo	Check	% increase		
1	Keonjhar	Vallabh Urd-1	25	10	5.65	4.20	34.52	14300	9200	55.43	1.45	1.55
2	Nabarangapur	RU 03-04	50	20	7.10	4.90	44.90	49800	29300	69.97	2.20	2.57
3	Rayagada	RU-03-14	25	10	7.80	6.20	25.81	25640	17060	50.29	1.60	2.09
4	Sundargarh-II	Indira	25	10	6.75	4.80	40.63	20400	11000	85.45	1.95	1.84
			<b>125</b>	<b>50</b>	<b>6.83</b>	<b>5.03</b>	<b>35.82</b>	<b>27535</b>	<b>16640</b>	<b>65.47</b>	<b>1.80</b>	<b>2.01</b>

**Photographs of Blackgram (*Kharif*)**



*KVK Kalahandi*



*KVK Rayagarh*



*KVK Nabarangapur*

**(iii) Greengram:**

Greengram was demonstrated during *kharif* in an area of 40 ha. The programme was conducted by KVK-Boudh, Sonapur and Ganjam-II. Greengram varieties viz IPM 02-14 and *Virat* were demonstrated. The average demonstrated yield of 5.95 q/ha with yield increase of 26.60 per cent was recorded in this zone against farmers existing yield (4.7q/ha). Table 5 shows that the difference of yield between demo and check was 1.25 q/ha.

**Varietal Performance of Greengram**

A total of 75 number of demonstrations were conducted on greengram variety IPM-02-14 through *Krishi Vigyan Kendras* of Boudh (10ha) and Sonapur (20ha). Demonstration on greengram variety *Virat* was conducted by KVK-Ganjam-II in an area of 10 ha. Technologies demonstrated are seed treatment with bio fertilizers, line sowing, application of fertilizer on soil test basis, application of soil ameliorants, spray of micronutrients and need based plant protection measure. Table -5 shows that the percentage increase in yield is higher in *Virat* (33.33%) than IPM-02-14(22.41%) however the BCR is almost at par. *i.e* 1.9 and 2.1, respectively.


**Table 5: CFLDs on Greengram under NFSM during *kharif* 2021-22 in Odisha**

Sl. No.	Name of the KVK/ Districts	Name of variety demonstrated	Achievement		Average yield (q/ha)			Net returns (Rs./ha)			Diff. of yield btw demo & check (q/ha)	Demo BCR
			Demo-no.	Area (ha)	Demo	Check	% increase	Demo	Check	% increase		
1	Boudh	IPM-02-14	25	10	6.70	5.70	17.54	17700	9450	87.30	1.00	1.60
2	Sonepur	IPM-02-14	50	20	7.50	5.90	27.12	17500	14780	18.40	1.60	1.90
<b>Total /Average</b>			<b>75</b>	<b>30</b>	<b>7.10</b>	<b>5.80</b>	<b>22.41</b>	<b>17600</b>	<b>12115</b>	<b>45.27</b>	<b>1.30</b>	<b>1.75</b>
1	Ganjam-II	<i>Virat</i>	25	10	4.80	3.60	33.33	15200	8700	74.71	1.20	2.11
<b>Grand total/Average</b>			<b>100</b>	<b>40</b>	<b>5.95</b>	<b>4.70</b>	<b>26.60</b>	<b>16400</b>	<b>10408</b>	<b>57.58</b>	<b>1.25</b>	<b>1.93</b>

### Photographs of Greengram (*Kharif*)


*KVK Kalahandi*

*KVK Rayagarh*

*KVK Nabarangapur*

## 5. b. West Bengal

### (i) Pigeonpea:

A total of 75 number of demonstrations on pigeonpea was conducted in an area of 30 ha by three (03) KVKs viz. Purulia, Murshidabad (Additional) and Jhargram in West Bengal. KVK-wise allocation and achievement is given in Table -6. The average demonstration yield was 13.98 q/ha, which is 43.17 per cent more over the farmers' yield of 9.77 q/ha. The BCR of demo and check is 2.28.

### Varietal Performance of Pigeonpea

Three pigeonpea varieties namely LRG-41, *Laxmi*, and ICP-8863 were demonstrated in 10 ha area each. From table 6 it is observed that *Laxmi* variety yields in the demo was 14.3 q/ha which was very high in compared to LRG-41 (10.2 q/ha) and ICP-8863 (12.75 q/ha). However, the net BCR of variety LRG-41, *Laxmi*, and ICP-8863 demo and check is was at par (2.2).



**Table 6: CFLDs on Pigeonpea under NFSM during *kharif* 2021-22 in West Bengal**

Sl. No.	Name of the KVK/Districts	Name of variety demonstrated	Achievement		Average yield (q/ha)			Net returns (Rs./ha)			Diff. of yield btw demo & check (q/ha)	Demo BCR
			Demo no.	Area (ha)	Demo	Check	% increase	Demo	Check	% increase		
1	Purulia	LRG-41	25	10	10.20	5.30	92.45	27100	16200	67.28	4.90	2.21
2	Murshidabad (Addl.)	Laxmi	25	10	14.30	16.50	50.52	44500	35100	26.78	2.50	2.41
3	Jhargram	ICP-8863	25	10	12.75	7.50	70.00	61000	30500	100.00	5.25	2.21
<b>Grand Total/ Average</b>			<b>75</b>	<b>30</b>	<b>12.41</b>	<b>7.43</b>	<b>67.02</b>	<b>44200</b>	<b>27267</b>	<b>62.10</b>	<b>4.22</b>	<b>2.28</b>

**Photographs of Pigeonpea**



*KVK Murshidabad (Addl.)*



*KVK Jhargram*



*KVK Purulia*

**(ii) Blackgram:**

During *kharif*, CFLD on blackgram was demonstrated in an area of 230 ha, which was carried out through 10 KVKs of West Bengal. The variety PU 31 covered nearly 70 per cent (160 ha) of the total area under demonstration. Blackgram varieties *Sulata* and IPU-02-43 were demonstrated in an area of 40 ha and 30 ha, respectively. Overall, the demo plot records an average 31.66 per cent increase in yield over the average check yield. The average net return was Rs. 29171/ha and BCR of 2.25 was recorded.

**Varietal Performance of Blackgram:**

CFLDs were conducted for three varieties viz. *Pant Urd* -31, *Sulata* and IPU-02-43 involving 575 farmers. *Pant Urd* 31, a high yielding and yellow mosaic disease resistant variety of blackgram gave a maximum % increase of yield (42.02) among other blackgram varieties demonstrated (*Sulata* and IPU-02-43). The average yield of *Pant Urd* 31 is 10.74 q/ha, for *Sulata* is 8.91q/ha and IPU-02-43 is 8.35 q/ha. Among the three KVKs opted for IPU-02-43 variety, KVK Nadia obtained an average yield of 11.5 q/ha with BCR of 2. The maximum difference of yield between demo and check of 3.18q/ha for PU 31, 2.17q/ha for *Sulata* and 1.39 q/ha for IPU-02-43 (Table 7) was observed.





**Table: 7 CFLDs on Blackgram under NFSM during *kharif* 2021-22 in West Bengal**

Sl. No.	Name of the KVK/ Districts	Name of variety demonstrated	Achievement		Average yield (q/ha)			Net returns (Rs./ha)			Diff. of yield btw demo & check (q/ha)	Demo BCR
			Demo No.	Area (ha)	Demo	Check	% increase	Demo	Check	% increase		
1	Bankura	PU-31	25	10	12.50	10.00	25.00	22000	20000	10.0	2.50	2.57
2	Birbhum	PU-31	50	20	10.90	6.20	75.81	46525	19275	<b>141.37</b>	4.70	3.46
3	Coochbehar	PU-31	50	20	9.64	6.90	39.71	31128	15109	106.02	2.74	2.09
4	Jalpaiguri	PU 31	50	20	7.58	6.00	26.33	22546	13700	64.57	1.58	1.92
5	Malda	PU-31	75	30	11.18	6.65	68.12	41796	20711	101.81	4.53	3.13
6	Nadia	PU-31	25	10	11.50	10.00	15.00	25660	18380	39.61	1.50	1.80
7	Murshidabad	PU-31	50	20	14.06	9.00	56.22	41801	19800	111.12	5.06	2.83
8	Purulia	PU-31	25	10	10.45	5.95	75.63	35640	16224	119.67	4.50	2.36
9	Murshidabad (Addl)	PU-31	25	10	10.00	7.00	42.86	33400	19000	75.79	3.00	2.25
10	Uttar Dinajpur	PU-31	25	10	9.56	7.90	21.01	41600	30650	35.73	1.66	2.38
<b>Total /Average</b>			<b>400</b>	<b>160</b>	<b>10.74</b>	<b>7.56</b>	<b>42.02</b>	<b>34210</b>	<b>19285</b>	<b>77.39</b>	<b>3.18</b>	<b>2.48</b>
1	D. Dinajpur	Sulata	50	20	8.45	6.60	28.03	18100	7400	144.59	1.85	2.02
2	North 24 Parganas	Sulata	50	20	9.37	6.88	36.19	34405	14340	139.92	2.49	2.30
<b>Total /Average</b>			<b>100</b>	<b>40</b>	<b>8.91</b>	<b>6.74</b>	<b>32.11</b>	<b>26253</b>	<b>10870</b>	<b>141.51</b>	<b>2.17</b>	<b>2.16</b>
1	Nadia	IPU-02-43	25	10	11.50	10.00	15.00	27350	18380	48.80	1.50	1.90
2	Purba Medinipur	IPU-02-43	25	10	4.00	3.00	33.33	12200	6600	84.85	1.00	2.08
3	Uttar Dinajpur	IPU-02-43	25	10	9.56	7.90	21.01	41600	30650	35.73	1.66	2.38
<b>Total /Average</b>			<b>75</b>	<b>30</b>	<b>8.35</b>	<b>6.97</b>	<b>19.90</b>	<b>27050</b>	<b>18543</b>	<b>45.87</b>	<b>1.39</b>	<b>2.12</b>
<b>Grand total/Average</b>			<b>575</b>	<b>230</b>	<b>9.33</b>	<b>7.09</b>	<b>31.66</b>	<b>29171</b>	<b>16233</b>	<b>79.70</b>	<b>2.24</b>	<b>2.25</b>

**Photographs of Blackgram (*Kharif*)**



**KVK Bankura**



**KVK D. Dinajpur**



**KVK Jalpaiguri**



### (iii) Greengram:

CFLDs of greengram was conducted in an area of 10 ha each by three KVKs-Kalimpong, Purulia and Murshidabad (Addl.) in West Bengal. The average demonstrated yield recorded was 9.27 q/ha in comparison to farmers existing yield 6.56q/ha. There was an average 41.38 per cent increase in yield over the average check yield. The average net return was Rs. 32377/ha and BCR of 2.26 was computed.

### Varietal Performance of Greengram:

KVK Murshidabad (Addl.) conducted demonstration in 10ha for *Virat* (IPM-205-7) and obtained an average yield of 11q/ha in comparison to farmers existing yield 9 q/ha. Variety SML-668 was demonstrated in 10 ha by KVK Kalimpong and the average yield in the demo plot was 8.18 q/ha which was 58 per cent more than check (5.17 q/ha). To popularize improved greengram variety IPM 02-14 (*Shreya*), 25 demonstrations were conducted with recommended package of practices by KVK Purulia. The average demonstrated yield recorded was 8.63 q/ha in comparison to farmers existing yield 5.5q/ha. The BCR of three varieties was around 2.26.

**Table 8: CFLDs on Greengram under NFSM during *kharif* 2021-22 in West Bengal**

Sl. No.	Name of the KVK/ Districts	Name of variety demonstrated	Achievement		Average yield (q/ha)			Net returns (Rs./ha)			Diff. of yield btw demo & check (q/ha)	Demo BCR
			Demo No.	Area (ha)	Demo	Check	% increase	Demo	Check	% increase		
1	Kalimpong	SML 668	25	10	8.18	5.17	58.22	27130	10920	148.44	3.01	2.23
2	Purulia	IPM-02-14	25	10	8.63	5.50	56.91	38500	16305	136.12	3.13	2.39
3	Murshidabad (Addl)	<i>Virat</i>	25	10	11.00	9.00	22.22	31500	23200	35.78	2.00	2.17
<b>Grand Total/Average</b>			<b>75</b>	<b>30</b>	<b>9.27</b>	<b>6.56</b>	<b>41.38</b>	<b>32377</b>	<b>16808</b>	<b>92.62</b>	<b>2.71</b>	<b>2.26</b>

### Photographs of Greengram (*Kharif*)



*KVK Murshidabad (Additional)*



*KVK Kalimpong*



## 6. CFLD on pulses during Summer 2022

### 6. a. West Bengal

#### (i) Blackgram:

Cluster FLDs on blackgram variety PU-31 was demonstrated in an area of 40 ha. The demonstration was conducted both in KVK-Murshidabad and Murshidabad (Addl.) in 20 ha each. CFLD on blackgram variety PU-01 was demonstrated in 10 ha by KVK Birbhum. The results in table 9 shows the average demonstrated yield of 12.78 q/ha with yield increase of 46.37 per cent as compared to farmers existing yield (8.73q/ha).

#### Varietal Performance of Blackgram

Nearly 100 demonstrations were conducted on blackgram variety *Pant Urd-31*. The improved technologies consisting of seed treatment with *Trichoderma viridae*- 4g/kg, soil application- *Azotobactor* and Phosphate Solubilising Bacteria @ 1.5 kg each/ ha and soil application 7.5 kg/ha Boron and foliar application of Boron @ 2g/l of water at 25 and 45 days of sowing were applied. Impact assessment recorded higher yield as well as higher economic return (88.31%) as compared to the farmers' local practices. The demonstration of technologies gave higher average yield of 12.78 q/ha. The table reveals that improved technologies give higher average net return of Rs. 46418/ha in comparison to check (farmers' practice). KVK Birbhum conducted demo on blackgram variety *Pant Urd-01* and obtained 5q/ha difference of average demo (12.2q/ha) and check yield. Overall, the average BCR of demo was 3.1.

**Table 9: CFLDs on Blackgram under NFSM during Summer 2022 in West Bengal**

Sl. No.	Name of the KVK/ Districts	Name of variety demon strated	Achievement		Average yield (q/ha)			Net returns (Rs./ha)			Diff.of yield btw demo & check (q/ ha)	Demo BCR
			Demo No.	Area (ha)	Demo	Check	% in-crease	Demo	Check	% in-crease		
1	Birbhum	PU-01	25	10	12.20	7.20	69.44	<b>49400</b>	<b>17450</b>	<b>183.09</b>	5.00	3.79
2	Murshidabad	PU 31	50	20	13.12	9.00	45.78	51375	30000	71.25	4.12	3.08
3	Murshidabad (Addl.)	PU 31	50	20	13.03	10.00	30.30	38480	26500	45.21	3.03	2.45
<b>Grand total/Average</b>			<b>125</b>	<b>50</b>	<b>12.78</b>	<b>8.73</b>	<b>46.37</b>	<b>46418</b>	<b>24650</b>	<b>88.31</b>	<b>4.05</b>	<b>3.11</b>

#### Photographs of Blackgram (Summer)



*KVK Birbhum*



*KVK Murshidabad (Additional)*



### (ii) Greengram:

During summer 2022, CFLD on greengram was demonstrated in West Bengal and A&N Islands. Cluster demonstrations on greengram (summer) was conducted in an area of 100 ha in West Bengal (by KVKs of Birbhum, Hooghly, South 24 Parganas, Uttar Dinajpur) and demonstrated in an area of 0.5 ha in A&N Islands. Mainly IPM-205-07 (*Virat*) variety was taken under greengram CFLDs along with other varieties like IPM-205-07 (*Virat*) and CARI *Moong* 2. The results depict that the average demonstration yield of 8.78q/ha could be obtained with yield increase of 47.57 per cent as compared to farmers existing yield of 5.95q/ha.

### Varietal Performance of greengram

Greengram varieties IPM-205-07 (*Virat*), IPM 2-14, and CARI *Moong* 2 were demonstrated in an area 80 ha, 20 ha, and 0.5 ha, respectively. Greengram variety IPM-205-07 (*Virat*), produced an average yield of 10.78 q/ha, a 43.94 per cent increase in yield above the local check yield of 7.49 q/ha (in table 10). The average gain in net returns was 75.39 per cent when compared to the check. The average yield difference between demo and check yield for the *Virat* variety is 3.29 q/ha. KVK Uttar Dinajpur carried out demonstration on IPM 02-14 in 20 ha. It recorded the highest yield of 13.41 q/ha among the three varieties demonstrated. The average benefit cost ratio was 2.86.

### (iii) Varietal Performance of Greengram in A&N Islands:

In KVK North and Middle Andaman, greengram variety CARI *Moong* 2 was demonstrated in 0.5 ha. The yield performance was below the expectation due to lack of input availability. However, the average gain in net returns was more than 74 per cent when compared to the check.

**Table 10: Greengram under CFLD during Summer 2022 in West Bengal and A&N Islands**

Sl. No.	Name of the KVK/ Districts	Name of variety demonstrated	Achievement		Average yield (q/ha)			Net returns (Rs./ha)			Diff. of yield btw demo & check (q/ha)	Demo BCR
			Demo no.	Area (ha)	Demo	Check	% increase	Demo	Check	% increase		
1	Birbhum	IPM-205-07 ( <i>Virat</i> )	25	10	12.70	8.00	58.75	55000	28100	95.73	4.70	3.59
2	Hooghly	IPM-205-07 ( <i>Virat</i> )	50	20	10.10	7.20	40.28	37525	21000	78.69	2.90	2.33
3	Howrah	IPM-205-07 ( <i>Virat</i> )	50	20	10.70	6.80	57.35	38900	19770	96.76	3.90	2.31
4	South 24 Parganas Nimpith	IPM 205-7( <i>Virat</i> )	75	30	9.61	7.95	20.88	27285	21620	26.20	1.66	1.90
<b>Total /Average</b>			<b>200</b>	<b>80</b>	<b>10.78</b>	<b>7.49</b>	<b>43.94</b>	<b>39678</b>	<b>22623</b>	<b>75.39</b>	<b>3.29</b>	<b>2.53</b>
1	Uttar Dinajpur	IPM 2-14	50	20	13.41	9.26	44.82	69175	40650	70.17	4.15	3.20
1	N& M Andaman	CARI <i>Moong</i> 2	3	0.5	2.15	1.10	95.45	68775	39420	74.47	1.05	2.85
<b>Grand Total/ Average</b>			<b>251.25</b>	<b>100.5</b>	<b>8.78</b>	<b>5.95</b>	<b>47.57</b>	<b>59209</b>	<b>34231</b>	<b>73.34</b>	<b>2.83</b>	<b>2.86</b>



### Photographs of Greengram (Summer)



*KVK Birbhum*



*KVK Hooghly*



*KVK South Parganas, Nimpith*



*KVK South Parganas, Nimpith*



*KVK Hooghly*



## 7. Best Technologies

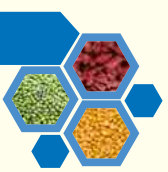
Various advanced technologies and practices were identified by KVKs to conduct the demonstration. These improved technologies are use of improved varieties of seeds, seed treatment with *Rhizobium* culture@ 20gm/kg /Thiram @ 3g/kg seed, /*Trichoderma viridae*- 4g/ kg, or *Pseudomonas* @ 200gm/ha, Basal application of bio fertilisers like *Rhizobium* @2kg/ha and PSB @ 2kg/ha; application of chemical fertilizers based on soil test reports , application of micronutrient- Zn @25kg/ha, management of weed infestation through application of pre-emergence weedicide Pendimethalin @ 2.5 l/ha, Integrated pest management by application of Imidacloprid @ 140 ml/ha for control of sucking pest, Profenofos @ 1l /ha for control of leaf webber and erection of Pheromonone trap with *Helilure* @ 20 nos./ha for control of pod borer. Some of the best technologies demonstrated by KVKs are listed in Table 11.

**Table 11: List of Best Technologies Demonstrated in CFLD Pulses**

Sl.no.	Crop	KVK Name	Technology	Av. yield (q/ha)	Existing yield (q/ha)	% increase in yield
1	Pigeonpea	Bargarh	Variety :PRG-176,Line sowing - 60cmx30cm, Seed treatment with <i>Rhizobium</i> culture@20gm/kg seed,STBF spraying of hormone Planofix@1ml/4.5 l, spraying of pesticide Prophenophos 50EC @2ml/l	9.5	5.7	65.19
		Rayagada	Variety: PRG 176, Seed treatment with Thiram@ 3g/kg seed, for control of heavy weed infestation application of pre-emergence weedicide Pendimethalin @ 2.5 l/ha, Integrated Pest Management by application of Imidacloprid @ 140 ml/ha for control of sucking pest, Profenofos @ 1l /ha for control of leaf webber andPheromonone trap with <i>Helilure</i> @ 20 nos./ ha for control of pod borer	14.5	9.7	49.48
		Purulia	Variety: LRG-41, Seed rate @20kg/ha; Seed Treatment- <i>Trichoderma viride</i> @200gm/ha and <i>Pseudomonas</i> @ 200gm/ha; basal application of biofertilisers <i>Rhizobium</i> @2kg/ha; and PSB @ 2kg/ha; Application of fertilizer- 30kg N and 100 kg P <sub>2</sub> O <sub>5</sub> /ha, Application of micronutrient-Zn @25kg/ha, Application of need based plant protection: Gram pod borer ( <i>Helicoverpa armigera</i> )-Azadirachtin 3 ml/l, wilt ( <i>Fusarium udum</i> )	10.2	5.3	92.45



Sl.no.	Crop	KVK Name	Technology	Av. yield (q/ha)	Existing yield (q/ha)	% increase in yield
2	Blackgram	Nabarangapur	Variety: RU 03-04, Line sowing (30X10 cm), STBFA dose of fertilizer NPK 25:50:40 kg/ha, Foliar sprayed of multi micro-nutrients @ 2ml/l once at pre-flowering stage, applied fungicide Carbendazim 12%+Mancozeb 63% @1.5 ml /l for control of brown spot and other leaf spot, applied insecticide @ Deltamethrin1%+Trizaphos35%@ 2 ml /l to control pod borer & stem borer and Acetamiprid 20% @ 2 ml/L to control white fly.	7.1	4.9	44.90
		Sundargarh-II	Variety: <i>Indira</i> , Seed rate-20 kg/ha, Seed treatment with Carbendazim 50% @2g/kg of seed followed by seed inoculation with <i>Rhizobium</i> culture@20g/kg of seed, Line sowing spaced at 30cmX10 cm. Weed management by the application of Pendimethalin @3 l/ha. Application of PSB @ 5 kg/ha, Micro nutrient application @12.5 kg/ha. Pest management by Imidacloprid 17.8SL@ 125mg/ha &Profeonophos +Chloropyriphos @ 1l/ha	6.7	4.8	40.63
		Birbhum	Variety: PU-31, application of herbicides-Pendimethalin as pre emergence @ 3l/ha, micronutrient spray Boron-20 @ 2g/l water in 25 and 45 DAS	10.9	6.2	75.81
		Murshidabad (Addl.)	Variety : PU-31, Seed treatment- <i>Trichoderma viridae</i> - 4 g/kg, Soil application- <i>Azotobactor</i> + PSB@ 200g each, and foliar application of micronutrient mixture @ 2 g/l of water and soil application of boron @ 7.5 kg/ha	10	7.0	42.86
3	Blackgram (summer)	Birbhum	Variety: PU-01, application of herbicides Pendimethalin as pre emergences @3 l/ha, micronutrient spray Boron-20 @2gm/l water at 25 and 45 DAS	12.2	7.2	69.44
4	Greengram (summer)	Uttar Dinajpur	Variety: IPM 2-14, Seed treatment with <i>Rhizobium</i> @ 20 g/ kg of seed followed by <i>Trichoderma</i> @ 4 g/ kg of seed at 7 days interval, Basal application of <i>Rhizobium</i> @ 0.5 kg/ha , <i>Azotobacter</i> and PSB @ 4 kg/ ha, Application of Pendimathalin 30 EC @ 2.0 ml/l as pre-emergence herbicides and Propaquizalop @ 2.0 ml/l as post-emergence herbicides , Application of Boron as micronutrient @ 2.0 g/l of water at 25, 45-50 DAS, need based application of insecticide and fungicide	13.4	9.2	44.82



### Photographs of Best Technology



*Sowing of pigeonpea in ridges, KVK Bargarh*



*Demonstration of mechanical weeder in pigeonpea, KVK Bargarh*



*Seed treatment, KVK Keonjhar*



*Line sowing, KVK Sundargarh II*



*Seed Treatment of Pigeonpea, KVK Nayagarh*



*Field day Nadia KVK*



*Application of Pre-emergence herbicides, KVK Boudh*



*Line sowing, KVK Sundargarh II*





## 8. Extension Activities

Different extension activities under CFLDs included farmers’ trainings, awareness camp, field days, field visits etc. These activities were organized by 32 KVKs of Odisha, West Bengal and A&N Islands during the implementation of the project in *Kharif* and Summer seasons for the benefit of farmers. During these programmes technical knowledge of improved package of practices generated were imparted among the farmers for adoption of good agricultural practices. A total 215 extension activities were organized by the KVKs of these states for 5362 farmers’ during the year.

**Table 12: Season wise extension activities undertaken by different KVK on CFLD Pulses**

Programmes	No. of programmes	No. of farmer participated
<b>Kharif</b>		
Awareness camp	11	301
Field visit	47	846
Group meeting	9	234
Field day	27	998
Training	58	1628
Diagnostic visit	19	345
<b>Summer</b>		
Training	17	527
Field day	14	214
Field visit	13	269
<b>Total</b>	<b>215</b>	<b>5362</b>

### Photographs of Extension activities



*KVK Bargarh*



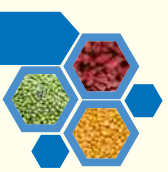
*KVK Bargarh*



*KVK Boudh*



*KVK Gajapati*



*KVK Keonjhar*



*KVK Sundargarh II*



*KVK Nayagarh*



*KVK Murshidabad(Addl.)*



*KVK Murshidabad(Addl.)*



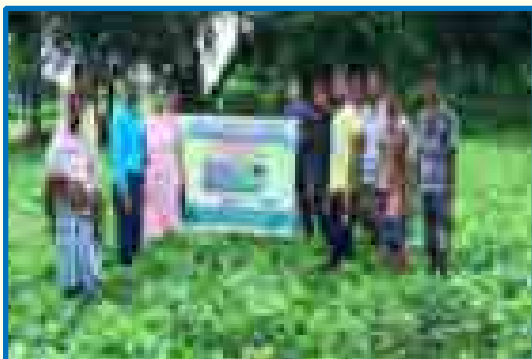
*KVK P. Medinipur*



*KVK Purulia*



*KVK Purulia*



*KVK Bankura*



*KVK Birbhum*



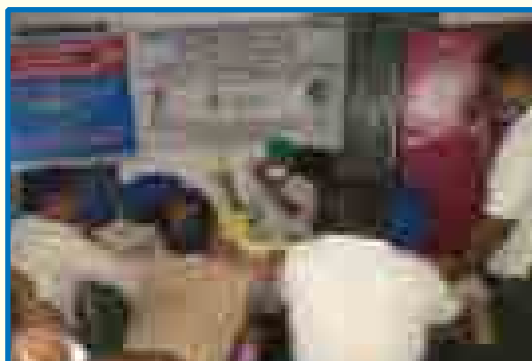
*KVK Jalpaiguri*



*KVK Murshidabad*



*KVK Nadia*



*KVK U. Dinajpur*



*KVK Birbhum*



*KVK Murshidabad (Addl.)*



## 9. Success Stories

### Success Story 1

**Name: Shri. Nimala Gopal**

Vill: Armada, Block- Ramnaguda,

Dist: Rayagada, Odisha

Pin: 765023



Rayagarh of Odisha is considered as one of the major pulse growing districts with potentiality to produce a number of pulse crops during kharif. However, prevalence of traditional practice like broadcasting of seeds, traditional varieties and erratic irrigation schedule hardly produce the desired yield to satisfy the farmers.

Shri. Nimala Gopal one such farmer was engaged in pulses cultivation for a fairly long period particularly on pigeonpea but non adoption of improved seed followed by scientific cultivation practices made him spend more but earn less. The cluster frontline demonstration (CFLD) conducted in his field by KVK Rayagarh with his consent, however, changed his outlook towards pigeonpea cultivation during *kharif* 2021.

Appropriate application of seed treatment chemical (Thiram @ 3g/kg seed), weed control measures with of pre-emergence weedicide (Pendimethalin @ 2.5 l/ha), IPM measures like application of Imidacloprid @ 140 ml/ha for control of sucking pest, Profenofos @ 1 l/ha for control of leaf webber and Pheromone trap with *Helilure* @ 20 nos./ha and spraying of Azadiractin 0.15% @ 1.5 l/ha at 50% flowering followed by Flubendiamide 48SC @ 200ml/ha (2ml/5 l water) at pod formation stage and Bt @ 1kg/ha (2g/L) at 15 days interval for control of pod borer.

Among the package of practices demonstrated, the variety PGR-176 performed very well as it was suitable for low rainfall areas where incidence of pest and disease is quite low. The success in terms of higher yield and economic benefit has not only motivated Shri. Gopal to get him enrolled for the coming *rabi* season also along with a good chunk of fellow farmer.

#### Performance of technology vis-à-vis Local check (Increase in yield and returns)

Used Practice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer practices	9.7	32000.00	61110.00	29110.00	1.91
Demonstration	15.8	35750.00	99540.00	63790.00	2.78
% Increase	62.9				

**Note:** Potential yield of variety- 20.0 q/ha; District average yield - 13.84 q/ha; State average yield -9.61q/ ha (Source/year <https://dpd.gov.in/Varieties/Pigeonpea%20Varieties.pdf>, [www.https://eands.dacnet.nic.in/APY; 2020-21](http://www.https://eands.dacnet.nic.in/APY; 2020-21))

#### Photographs:





## Success Story 2

**Name:** Shri. Kailash Mahato

Vill: Chitra,  
P.O. : Anai- Jambad, Block - Para,  
Dist: Purulia, West Bengal  
Pin: 723155



Success is not always measured in terms of economic gain but also in respect of change in cropping pattern, cultivation of newer crop and judicious utilization of crop geometry. The story of Shri. Kailash Mahato, a traditional rice grower in upland depicts the desired change brought by KVK Purulia through CFLD programme in pigeonpea during *kharif* 2021.

Paddy cultivation is discouraged in upland condition as it consumes substantial water, which is scarce, especially in rainfed. Though Shri. Mahato was continuing with upland paddy cultivation, his interaction with KVK followed by training influenced him to shift to pigeonpea cultivation under the guidance of KVK and complete package of practices ( variety LRG-41 with seed rate @20kg/ha, seed treatment with *Trichoderma viride* @200gm/ha and *Pseudomonas* @ 200gm/ha and basal application of *Rhizobium* @2kg/ha and PSB @ 2kg/ha, soil test based fertilizer application of 30kg N and 100 kg P<sub>2</sub>O<sub>5</sub>/ha, basal dose of Zn @25kg/ha , Azadirachtin 3 ml/l as plant protection measures against infestation of gram pod borer (*i.e. Helicoverpa armigera*).

Cultivation of pigeonpea in the upland condition has come as rescue to the existing problem of irrigation for Shri. Mahato. There is an increase of 67 per cent in net income from demonstrated field against traditional practices.

The variety and technologies demonstrated under CFLD performed better than local varieties cultivated elsewhere. The fellow farmers and neighboring farmers of villages were motivated with the yield in the demonstration plot.

### Performance of technology vis-à-vis Local check (Increase in yield and returns)

Used Practice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer practices	5.45	16900	33100	16200	1.95
Demonstration	10.20	22300	49400	27100	2.21
% Increase	87.15				

**Note:** Potential yield of variety- 20.0 q/ha; District average yield – 5.45 q/ha; State average yield-8.5q/ ha (Source/year [www.https://angrau.ac.in/downloads/CropVarieties/Redgram.pdf](https://angrau.ac.in/downloads/CropVarieties/Redgram.pdf); [www.https://eands.dacnet.nic.in/APY;2020-21](https://eands.dacnet.nic.in/APY;2020-21))

### Photographs:





## Success Story 3

**Name: Shri. Pramod Kumar Sahu**

Vill: Karmaahal  
Block: Kuarmuda  
Dist: Sundargarh, Odisha  
Pin: 770039



Shri. Sahu is a progressive farmer who has been growing pulses for a long time. He was growing low-yielding indigenous variety (*mala biri*) without proper nutrition and pest management. He cultivated blackgram on an acre of land and earned between Rs. 6000 and 7000 as net profit.

Shri. Sahu participated in the training programme on improved cultivation of blackgram conducted by the scientist of KVK, Sundargarh. CFLD on improved cultivation of blackgram was conducted at Shri. Sahu's field. The demonstration was monitored by KVK Scientists and diagnostic field visits were done to check the plant health and infestation of pest and diseases.

KVK Sundargarh provided improved black gram variety - *Indira* with seed treating chemical and *Rhizobium*. Line sowing was done following row to plant spacing of 30 cm X 10cm. The spacing was maintained by thinning of extra plants at 20 DAS. Application of Pendimethilin @3l/ha, basal application of PSB @ 5 kg/ ha and micronutrient @12.5 kg/ha were applied. Timely application of need based plant protection chemical was also done.

The improved variety and IPM practices gave better morphological growth like uniform flowering and pod development. Incidence of insect and diseases was also less due to timely application of appropriate pesticides. The application of right doses of fertilizers, maximized the net return. These practices helped Shri. Sahu to harvest a yield of 7.7 q/ha and earned a net profit of more than Rs. 29000/ ha by selling seeds to nearby markets.

Shri. Sahu persuaded his fellow farmers to adopt improved cultivation technologies like high yielding varieties, seed treatment, seed inoculation with bio fertilizer, pest and weed management etc.

### Performance of technology vis-à-vis Local check (Increase in yield and returns)

Used Practice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer practices	4.8	22600	38400	15800	1.69
Demonstration	7.7	24800	53900	29100	2.17
% Increase	60				

**Note:** Potential yield of variety- 12.0q/ha; District average yield-4.75 q/ha; State average yield- 5.04 q/ha(Source/year <https://dpd.gov.in/iv%20Urdbean%20Varieties.pdf>; [www.https://eands.dacnet.nic.in/APY;2020-21](https://eands.dacnet.nic.in/APY;2020-21))

### Photographs:





## Success Story 4

**Name:** Shri. Selim Raja

Vill: Mirkamary  
 P.O. & P.S.: Ratua  
 Block: Ratua-I  
 Dist: Malda, West Bengal  
 Pin: 732205



In popularizing new variety of pulse crop, KVK generally identified cluster of land and willing / acquainted farmers to carry out CFLD . KVK Malda of West Bengal initiated the CFLD programme through identification of willing farmers followed by training to make them skillful towards application of improved cultivation practices.

Shri. Selim Raja , a marginal farmer of Malda district went through the mentioned stages before allowing Malda KVK to conduct CFLD blackgram in his two acre of land. The programme started with providing improved blackgram variety of PU-31 along with seed treatment chemical, micronutrients, bio pesticides and herbicides . Regular supervision by the scientist and technical advise as and when required increase the yield of blackgram to the extent of 49 per cent more than the local check . Very less incidence of pest and disease due to the use of disease resistant variety helped further to enhance the yield and quality of blackgram. His produce earned him a net profit of Rs. 42000/- per ha through selling of seeds in nearby markets.

Shri. Raja became a role model for other farmers in the village and farmers in village came to know about scientific cultivation of blackgram. This has created awareness among the farmers of village and adjacent villages.

### Performance of technology vis-à-vis Local check (Increase in yield and returns)

UsedPractice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer practices	6.65	16473.00	40658.00	24185.00	2.47
Demonstration	13.13	19876.00	62188.00	42312.00	3.12
% Increase	49.33				

**Note:** Potential yield of variety-15q/ha; District average yield -9.25q /ha; State average yield-8.72 q/ha (Source/year <https://dpd.gov.in/iv%20Urdbean%20Varieties.pdf>; [www.https://eands.dacnet.nic.in/APY;2020-21](https://eands.dacnet.nic.in/APY;2020-21))

### Photographs:





## Success Story 5

**Name: Smt. Bacha Sabitri**

Vill: Kushapada, GP: Kushapada

Block: Digapahandi

Dist: Ganjam, Odisha

Pin: 761012



In Ganjam district paddy is the major crop followed by oilseeds and pulses. Among the pulse crops greengram and blackgram are extensively grown in the district. However, farmers get less profit from pulses cultivation due to continuation of traditional method of cultivation avoiding the improved package of practices. At this juncture KVK, Ganjam -II takes initiative to introduce cluster frontline demonstration with basket of technologies and Smt. Sabitri was among the front runners to participate in this programme.

KVK Ganjam-II conducted cluster frontline demonstration on greengram with 'Virat', a high yielding variety along with other scientific practices in *Kushapada* village. Smt. Sabitri after getting sufficient technical support from KVK, she cultivated greengram in an area of one acre. She was provided with seeds of *Virat* variety and other critical inputs. The KVK scientist regularly monitored the CFLD.

Improved seeds (*Virat*), seed treatment with (*Trichoderma viridae*) @ 5gm/kg seed, foliar spraying of N-P-K(19-19-19) @25kg/ha & micro nutrient 25 l/ha for better flowering, spraying of Sulphur 90% @40kg/ha for better growth of root, spraying of Neem Oil @2.5ml/l to prevent the insect & pest, spraying of Indoxacarb @ 1 ml/ l of water for controlling pod borer and use of pro super gunny bag for storage of seeds were the complete package provided to her.

Smt. Bacha Sabitri adopted the improved cultivation practices of greengram and harvested a yield of 5.1 q/ha and earned a net profit of Rs. 15200 /ha. This has created awareness among the farmers of village *Kushapada* and adjacent villages.

Mrs. Sabitri was highly aspirant about developing a farming system model in future from where she can get a sustainable income round the year. Farmers in village came to know about scientific cultivation of greengram and showed their willingness to start cultivation in near future.

### Performance of technology vis-à-vis Local check (Increase in yield and returns)

Used Practice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer practices	3.6	12900	21600	8700	1.67
Demonstration	5.1	13600	28800	15200	2.11
% Increase in yield	41.6				

**Note:** Potential yield of variety- 10-11q/ha; District average yield –3.6 q/ha; State average yield -4.95q/ha (Source/year <https://dpd.gov.in/iii/%20Mungbean%20varieties.pdf>; [www.https://eands.dacnet.nic.in/APY; 2020-21](https://eands.dacnet.nic.in/APY; 2020-21))

### Photographs:







## Success Story 6

**Name:** Shri. Sujay Mondal

**Vill:** Sabdarnagar

**District:** Murshidabad, West Bengal

**Pin:** 742175



Cultivation of greengram was not a new venture to Mr. Sujay Mondal, an enthusiastic farmer dedicated to improved agriculture. However, non-accessibility of improved technologies along with quality greengram seeds, he had to continue greengram cultivation with local and low yielding seeds only following conventional practices.

With the introduction of CFLD program by KVK Murshidabad in his village, Sabdarnagar, he was the first farmer to approach KVK to get involved in this special demonstration programme. After attending off-farm training, he was provided with technology package of *Trichodarma viridae*, *Azotobactor* + Phosphorous solubilizing bacteria and Boron. He was also advised to go for line sowing for cultivation of improved variety IPM 205-7. The entire period of crop cultivation was monitored by the KVK Scientist to help with out in the case of outbreak of disease and pest.

Constant monitoring and execution of improved practices by Shri. Mondal in his demonstrated plot fetched him a yield 11 q/ha with net profit of more than Rs. 31000/- per ha. The demonstrated plot of Shri. Mondal becomes a model farm both for the KVK and the neighboring farmers. A number of awareness programme along with field day was conducted in the presence of large number of farmers.

### Performance of technology vis-à-vis Local check (Increase in yield and returns)

Used Practice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer practices	9	24,500	47700	23200	1.94
Demonstration	11	26,800	58300	31500	2.17
% Increase	22.2				

**Note:** Potential yield of variety- 10-11q/ha; District average yield – 3.6 q/ha; State average yield -4.95q/ha (Source/year <https://dpd.gov.in/iii%20Mungbean%20varieties.pdf>; [www.https://eands.dacnet.nic.in/APY; 2020-21](http://www.https://eands.dacnet.nic.in/APY; 2020-21))

### Photographs:





## Success Story 7

**Name: Shri. Budhan Tudu**

Vill: Faridpur

P.O: Sattore

P.S: Bolpur

Dist: Birbhum, West Bengal

Pin: 731236



Shri. Tudu along with several others farmers of his locality had shown keen interest on growing summer pulses especially blackgram instead of summer paddy. Shri. Tudu led the other fellow farmers to become the beneficiaries of CFLD programme on summer pulses viz. blackgram cultivation in their locality.

Shri. Tudu and the group of farmers of Faridpur village, Block:-Bolpur-Sriniketan, District- Birbhum attended skill development training programmes on “Crop Diversification through introduction of improved oilseeds and pulses in both rabi and summer seasons”, organized by Rathindra KVK, Palli Siksha Bhavana, Visva-Bharati, Sriniketan, Birbhum.

The improved package included seeds of PU-01 variety to replace *Kali 50*, the existing variety. Application of Pendamethalin herbicide, foliar application of micronutrients (Boron) which was executed in the field of Shri. Tudu and other farmers. The scientific cultivation of blackgram produces more than double yield compared to local variety of *Kali 50*. It was also observed that foliar spray of Boron play beneficial role to increase the yield.

Selection of PU-01, a variety of shorter duration not only helped the farmers to harvest early but also number of pod formation was higher (48 in PU-01 and 26 in local variety) that ensured higher yield and net return.

### Performance of technology vis-à-vis Local check (Increase in yield and returns)

Used Practice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer practices	6.2	16650.00	34100.00	17450.00	2.04
Demonstration	12.75	17700.00	70125.00	52425.00	3.96
% Increase	105				

**Note:** Potential yield of variety- 14 q /ha; District average yield -6.22 q /ha; State average yield -6.61 q /ha(Source/year <https://dpd.gov.in/iv/%20Urdbean%20Varieties.pdf>;www.<https://eands.dacnet.nic.in/APY;2020-21>)

### Photographs:



KVK, Birbhum at the Vegetative Stage



KVK, Birbhum at the Harvesting Stage



## Success Story 8

**Name: Shri. Goutam Khatua**

P.O.: Madhya Gurguria

Block: Kultali

Dist: South 24 Parganas, West Bengal

Pin: 743338



Greengram cultivation is predominantly carried out with traditional / unscientific method of cultivation along with local varieties. This has led to low seed replacement rate in South 24 Parganas district of West Bengal, particularly in Kultali block. Shri Goutam Khatua, a progressive farmer was also following the same traditional until he come in contact with KVK Nimpith and could know about the improved method of greengram cultivation. He accepted that the low return from the existing cultivation (Rs. 6000-7000/- per annum) was solely due to traditional cultivation practices.

After undergoing training on improved pulses cultivation practices, he was selected as one of the CFLD farmers during summer season. Along with improved seed of Virat (IPM 205-7) other packages *Rhizobium*, PSB & KSB , multi micronutrient, plant protection chemicals on need basis were also made available to him for conducting demonstration in his land. The variety being tolerant to Yellow Vein Mosaic Virus (YVMV) with more number of pods per plant, least infestation of disease and pest was recorded followed by better quality of seed like bold as well as green in colour to help him market with higher price. The variety performed much better against the local *choitimoong* in terms of yield (10q/ha against 7.95 q/ha ) with net profit of Rs. 30000/- per ha.

The performance of CFLD on greengram with improved seed and scientific cultivation practices have attracted many a farmer from his own as well as adjoining villages to cultivate greengram and other season specific pulse crops. This has ultimately led to faster rate of seed replacement in the entire block.

### Performance of technology vis-à-vis Local check (Increase in yield and returns)

Used Practice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer practices	7.95	29250.00	48495.00	19245.00	1.65
Demonstration	10.20	30375.00	61200.00	30825.00	2.01
% Increase	28.30	-	-	-	-

**Note:** Potential yield of variety- 10-11q/ha; District average yield -5.8q/ha; State average yield -7.33 q/ha (Source/year <https://dpd.gov.in/iii/%20Mungbean%20varieties.pdf>; [www.eands.dacnet.nic.in/APY;2020-21](http://www.eands.dacnet.nic.in/APY;2020-21))

### Photographs:





## Success Story 9

**Name: Md. Saifuddin**

Vill: Bilashpur, Karandighi  
Dist: Uttar Dinajpur, West Bengal  
Pin: 733215



Md. Saifuddin a traditional pulse cultivator of Uttar Dinajpur district of West Bengal had to opt for improved greengram cultivation practices owing to significant decrease of greengram yield mainly for disease and pest infestation. His earning was reduced to Rs. 10000-12000/- per ha from traditional practice of broadcasting, non-application of integrated nutrient management and integrated pest management measures.

His contact with KVK Uttar Dinajpur, however, changed his fortune in terms of yield and net return from greengram cultivation. The knowledge and skill imparted by the KVK before implementing cluster frontline demonstration (CFLD) on greengram, motivated Md. Saifuddin to adopt new technologies and management practices like seed treatment with chemical, seed inoculants, pre and post emergent herbicide, micronutrient and improved seed of IPM 2-14.

Improved method of CFLD in greengram enhance the yield to the extent of 14.2 q/ha with a net return of more than Rs. 33000/- per ha within a single cropping season. Moreover, proper management practices also prevented the problem of leaf blight and leaf spot that ensured quality harvest.

### Performance of technology vis-à-vis Local check (Increase in yield and returns)

Used Practice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer practices	9.26	28800	49450	20650	1.7
Demonstration	14.28	31200	65017	33817	2.1
% Increase	54.21				

**Note:** Potential yield of variety- 11-12 q/ha; District average yield -7.74q/ha; State average yield-7.33q/ha (Source/year [www.https://dpd.gov.in/iii/%20Mungbean%20varieties.pdf](https://dpd.gov.in/iii/%20Mungbean%20varieties.pdf); [www.https://eands.dacnet.nic.in/APY;2020-21](https://eands.dacnet.nic.in/APY;2020-21))

### Photographs:





**10. Annexure –I Administrative approval of Cluster Frontline Demonstration on Pulses during 2021-22**



F. No. CPS 18-2/2021-NFSM (FTS; 97408)  
 Government of India  
 Ministry of Agriculture and Farmers Welfare  
 Department of Agriculture and Farmers Welfare  
 (Crops & PHMF Division, NFSM-Cell)

Krishi Bhawan, New Delhi,  
 Dated: 27<sup>th</sup> May, 2022

To,  
 Assistant Director General (Agri. Extn.)  
 ICAR, Division of Agriculture Extension  
 Krishi Anusandhan Bhavan-I,  
 Pusa, New Delhi-110012

**Sub:** Administrative approval for the Project on “Cluster Frontline Demonstrations on Pulses during 20-22-23” funding under NFSM-regarding.

Sir,

I am directed convey the approval of the competent authority for the project entitled “Cluster Frontline Demonstrations on Pulses during 2022-23” funding under Centrally Sponsored Scheme of National Food Security Mission (NFSM) for the financial year 2022-23 with a total outlay of **Rs. 35,61,18,400 (thirty-five crores sixty-one lakh eighteen thousand four hundred only)**. Cluster Frontline Demonstration trials project on new varieties and technology will be done through ICAR, KVKs.

2. The component wise/ATARI/Zone-wise budget approved is as under: -

(Amount in Rs)

Implementing agency/ Zone	No. Of KVK	No of Demon & Area in ha ( )	Budget for Cluster Demon /a Rs.9000/ ha (in Rs.)	Contractual Staff (amount in Rs.)*			Zonal Workshop cum Training	Group meeting (amount in Rs)	Misc. exp. (in Rs)	Total amount (in Rs.)
				SRF (for 12 month)	DEO (for 12 month)	PTA (for 6 month)				
				No.in ( )	No.in ( )	No.in ( )				
1	2	3	4	5	6	7	8	9	10	11
ATARI,Zone -I, Ludhiana	61	6800 (2720)	24480000	495600 (1)	300000 (1)	600000 (10)	90000	50000	30000	26045600
ATARI, Zone -II, Jodhpur	63	10775 (4310)	38790000	495600 (1)	300000 (1)	1740000 (29)	90000	50000	30000	41495600
ATARI,Zone-III, Kanpur	88	14200 (5680)	51120000	1029000 (2)	600000 (2)	1800000 (30)	90000	50000	30000	54719000
ATARI,Zone-IV, Patna	64	12225 (4890)	44010000	495600 (1)	300000 (1)	2280000 (38)	90000	50000	30000	47255600
ATARI,Zone-V, Kolkata	55	9725 (3890)	35010000	533400 (1)	300000 (1)	2040000 (34)	90000	50000	30000	38053400
ATARI,Zone-VI, Guwahati	36	4050 (1620)	14580000	495600 (1)	300000 (1)	360000 (6)	90000	50000	30000	15905600
ATARI,Zone-VII, Barapani	22	2425 (970)	8730000	457800 (1)	300000 (1)	180000 (3)	90000	50000	30000	9837800
ATARI,Zone-VIII, Pune	70	7900 (3160)	28440000	533400 (1)	300000 (1)	540000 (9)	90000	50000	30000	29983400
ATARI,Zone-IX, Jabalpur	78	12475 (4990)	44910000	495600 (1)	300000 (1)	1740000 (29)	90000	50000	30000	47615600
ATARI,Zone-X, Hyderabad	66	7850 (3140)	28260000	533400 (1)	300000 (1)	360000 (6)	90000	50000	30000	29623400
ATARI,Zone-XI, Bangalore	38	3950 (1580)	14220000	533400 (1)	300000 (1)	360000 (6)	90000	50000	30000	15583400
<b>Total</b>	<b>641</b>	<b>92375 (36950)</b>	<b>332550000</b>	<b>6098400 (12)</b>	<b>3600000 (12)</b>	<b>12000000 (200)</b>	<b>990000</b>	<b>550000</b>	<b>330000</b>	<b>356118400</b>

\* Contractual staff one SRF and one data entry operator for each ATARI and ICAR headquarter.

Contd. 2/-

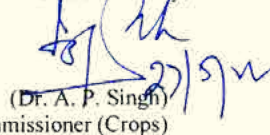
*[Handwritten Signature]*  
 27/5/22



3. The above project has been approved with the following conditions:

- The demonstrations of each pulse crop should be organized in cluster approach (at least 10 ha. in each cluster).
- ICAR should provide seed as one of the critical inputs to farmers for organization of demonstrations.
- The High Yielding Varieties of pulse crops to be included in the demonstrations should not be older than 10 years.
- More focus should be given to Pigeonpea and Lentil than other pulses crop.
- More focus should be given to organize demonstration on pulses in rice fallow areas in eastern India.
- Critical input amounting Rs. 8200/- out of Rs. 9000/- for Pulses should be provided to beneficiary farmers, Rs. 250/- for Organization of Field Day, Rs. 150/- for Display board publicity material (posters/pamphlets/leaflets etc.), Rs. 300/- for Visit of scientists excluding TA/DA, but hiring of Taxi/POL etc. and Rs. 100/- for Contingencies/typing of results/ minutes etc.
- Chemical fertilizers are not allowed as input under FLD. However, payment of various operations/ services and inputs (seed, bio-fertilizers, soil ameliorants, micro-nutrients etc.) are allowed. Farmers have to apply recommended dose of chemical fertilizers to attain potential yield.<sup>9</sup>
- The scientists from KVK will conduct visit to the demonstrations site to resolve problem on spot.
- Each KVK will furnish cafeteria of interventions for each crop to be undertaken at the demonstration site.
- For individual farmer, FLDs should not exceed more than 0.80 ha.
- The qualification and salary of Senior Research Fellow and Data Entry Operator is admissible as per the approved norms of the ICAR/University.
- One SRF and one Data entry operator is allowed at ICAR, headquarter, New Delhi.
- Traveling Allowance and Daily Allowance is admissible as per norms of Govt. of India.
- The organization of workshop cum training and group meetings should be organized as per norms of ICAR.
- The list of beneficiary-farmers should be maintained at each ATARI level.
- The contribution of individual intervention should also be documented.
- KVKs which shall conduct FLDs in 100 ha or more area during both the cropping season of a year is allowed to hire Pulse Technology Agents (PTAs) for 12 months and KVK which shall conduct FLDs in at least 50 ha or more area either in Kharif, Rabi and Summer season is allowed PTA for six months.
- **All implementing ATARIs should ensure to organize at least 10% of the C-FLDs on bio-fortified variety of pulses or as per availability of seed in the districts with high burden of malnutrition.**
- **KVK should ensure to organize at least 10% of the CFLDs in the Aspirational districts identified by this Department to increase the production, productivity of pulses and income of farmer.**
- **Under CFLDs full package kit like seed, INM, IPM material should be given to farmers at the time of sowing.**
- Each KVK should try to choose interior areas; farmers have generally been deprived of demonstrations conducted by extension agencies.
- KVK should focus on use of micro-nutrients, soil ameliorants and IPM practices.
- Each ATARI designated for a particular zone will prepare a detailed report on the demonstrations of pulses and a final report will be submitted by Agricultural Extension Division, ICAR, New Delhi.
- Geo-tagging of all CFLDs is compulsory which is to be included by each KVKs during 2022-23.
- In view renewed efforts, ICAR may demonstrate technologies like transplanting and early maturing varieties of pigeon pea.
- **The CFLDs in states Viz; West Bengal, Bihar, Odisha and North Eastern Region, LENTIL crop during Rabi may be given priority over chickpea.**
- **In view of the general dearth of quality seeds, farmers may be trained in quality seed production, primary processing and encouraged to use those self-saved seeds.**

Yours faithfully,



(Dr. A. P. Singh)

Additional Commissioner (Crops)

Contd.3/-



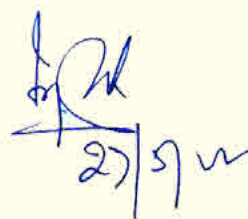
**Copy to:**

1. Director General, ICAR, Krishi Bhawan, New Delhi
2. Deputy Director General (CS), Krishi Bhawan, New Delhi
3. Deputy Director General (Agriculture Extension), ICAR, New Delhi.
4. Director, ATARI, Zone-I, Ludhiana, Punjab.
5. Director, ATARI, Zone-II, Jodhpur, Rajasthan.
6. Director, ATARI, Zone-III, Kanpur, Uttar Pradesh,
7. Director, ATARI, Zone-IV, Patna, Bihar,
8. Director, ATARI, Zone-V, Kolkata, West Bengal.
9. Director, ATARI, Zone-VI, Guwahati, Assam,
10. Director, ATARI, Zone-VII, Umiam (Barapani) Meghalaya.
11. Director, ATARI, Zone-VIII, Pune, Maharashtra.
12. Director, ATARI, Zone-IX, Jabalpur, Madhya Pradesh.
13. Director, ATARI, Zone-X, Hyderabad, Andhra Pradesh
14. Director, ATARI, Zone-XI, Bengaluru, Karnataka
15. Director of Agriculture, Government of Assam, Arunachal Pradesh, Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, J&K, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Meghalaya, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Telangana, Uttar Pradesh, Uttarakhand and West Bengal.
16. Director, Crops Development Directorate, DWD-Gurugram, DJD-Kolkata, DSD-Lucknow, DOD-Hyderabad, DMD-Jaipur, DPD-Bhopal, DCD-Nagpur and DRD Patna.

**Copy also to:-**

1. Under Secretary (Finance), DA&FW, Krishi Bhawan, New Delhi.
2. Under Secretary (CA-V), DA&FW, Krishi Bhawan, New Delhi.
3. Sr. PPS to Secretary (A&FW), Krishi Bhawan, New Delhi.
4. Sr. PPS to Agriculture Commissioner, DAC&FW, Krishi Bhawan, New Delhi.
5. PPS to JS (Crops), DA&FW, Krishi Bhawan, New Delhi.
6. PS to Dy. Secretary (Crops), DA&FW, Krishi Bhawan, New Delhi.
7. PS to Additional Commissioner (Crops), Krishi Bhawan, New Delhi.
8. DC/AC (Crops)/Consultants, NFSM/AD/STA (Crops), Krishi Bhawan, New Delhi.
9. Lead Programmer NFSM, to upload in the website.
10. Guard file

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## 11. Annexure – II Final Result of Cluster Frontline Demonstration on Pulses during 2021-22



### Yield of Kharif Pulses 2021-22

**Crop Name: Pigeonpea**

Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Exist- ing yield (q/ ha)	% in- crease over exist- ing	Farmer's Existing plot			Demonstration plot			
						Max.	Min.	Av.			Gross return (Rs/ha)	Gross Cost (Rs/ha)	B:C ratio	Net Re- turn (Rs/ ha)	Gross return (Rs/ha)	Gross Cost (Rs/ha)	B:C ratio
Bargarh	PRG-176	Variety: PRG-176, Line sowing - 60cmx30cm, Seed treatment with Rhizobium culture@20gm/kg seed, STBF Spraying of Hormone Planofix@1ml/4.5 L, spraying of pesticide Prophe- nophos50EC@2ml/L	94	20	Kandula	9.82	9.21	9.515	5.76	65.2	41700	57600	15900	65520	92100	26580	1.41
Boudh	PRG 176	Variety: PRG 176; Seed treatment with Carboxin+ Thiram; Application of herbicides (Pendimethalin and Imazethapyr)	25	20	Local	14	11.8	12.9	9.5	35.8	22650	43200	20550	24200	51600	27400	2.1
Deogarh	PRG-176	Variety : PRG-176, Seed treatment with Vitavax (carboxin + thiram) @ 2g per 1kg of seed, line sowing in spacing 75 cm X 30 cm., application of pre-emergence herbicide Pendimethalin 30 % EC @3 L/ha, soil test based fertiliser, micronutrient & WSF foliar nutrient recommendation and release of <i>Trichogramma chilonis</i> with need based plant protection measures	50	20	Local	14.8	7.4	10.24	7.6	34.7	32500	57000	24500	38600	91920	43320	2.38

Odisha



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (q/ha)	% increase over existing	Farmer's Existing plot			Demonstration plot			
						Max.	Min.	Av.			Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Gajapati	BRG-5	Variety : BRG-5, Seed rate of 15 kg per ha, Seed treatment with <i>Rhizobium</i> sp. @ 30g/kg, Pre-emergence application of Pendimethalin 30% EC @ 1.5ml/L followed by post emergence application of Imazethapyr 10% SL @ 2 ml/L at 21-25 DAS, Plant Protection to control pod borer application of Emamectin Benzoate 5 % SG @ 0.4 g/L, installation of yellow sticky trap @ 10 pcs/ha, for controlling <i>Fusarium</i> wilt spraying of Carbendazim 12% + Mancozeb 63% WP @ 2g/L, Foliar spray (2%) of water soluble NPK (19:19:19) at vegetative stage, Foliar application of 0.1 % Boron at flowering stage	50	20	Desi Kandula	11.5	10.6	11.05	8.1	36.4	23800	40520	16720	25700	55250	29550	2.15



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Exist- ing yield (q/ ha)	% in- crease over exist- ing	Farmer's Existing plot			Demonstration plot			
						Max.	Min.	Av.			Gross return (Rs/ha)	Gross Cost (Rs/ha)	Net Re- turn (Rs/ ha)	B:C ra- tio	Gross return (Rs/ha)	Gross Cost (Rs/ ha)	Net Re- turn (Rs/ ha)
Kalahandi	LRG-52	Variety : LRG-52 Line sowing of seed with spacing 75cmx60cm, Ap- plication of Post emer- gence herbicide ima- zythapyr @ 1.0 per ha followed by two hand weeding after 25 DAS & 45 DAS to control weed pop- ulation. Application of Pro- feno+Cypermethrin @1L/ ha to control leaf webber. Spraying of Azadirachtin 0.3% @ 2.5 L/ha and Acet- amiprid to control aphid/ thrip population. Alternate application of Flubendi- amide (@4ml/10L) and Emamectin Benzoate 5%SC (@ 4gml /10L) to control pod borer infesta- tion. Installation of Pher- omone trap @12 per ha for mass trapping of male pod borer during flowering stage.	25	20	LRG-52	13.5	10.9	12.2	10.2	19.6	37200	71400	34200	40500	85400	44900	2.1



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (q/ha)	% increase over existing	Farmer's Existing plot			Demonstration plot			
						Max.	Min.	Av.			Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)
Keonjhar	PRG-176	Var- PRG-176 Line sowing of seeds in spacing of 60X45cm, seed treatment with Vitavax power @ 2gm/kg of seeds, Seed inoculation with <i>Rhizobium</i> culture (20gm per kg of seeds). Basal application of fertilizers applied below the seed at the time of sowing @ 20kg N, 40kg P2O5, 20kg K2O, after 25Days, rest N (10kg) top dressed between two rows, release of trichocard @ 5/ha, Spraying of Indoxacarb 14.5% + Acetamiprid 2ml / L for controlling pod borer;twohoeing operation at 30DAS and 60DAS, two manual hand weeding one at 50 DAS and a second after 30 days, One irrigation at pod initiation stage. Spraying of Indoxacarb 0.5 L/ha for controlling pod borer;Two hoeing operation at 30DAS and 60DAS, Two manual hand weeding one at 50 DAS and a second after 30 days One irrigation at pod initiation stage. Spraying of indoxacarb 0.5 L/ha for controlling pod borer.	25	10	Local	10.2	7.5	8.8	7.3	20.5	22650	41800	20150	27360	55540	28180	2.02



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (q/ha)	% increase over existing	Farmer's Existing plot			Demonstration plot			
						Max.	Min.	Average			Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)
Koraput	LRG-52	LRG-52 Seed treatment With Carbandizim + Mancozeb 1st manual hand weeding pre emergent pendimethil followed by 1st hand weeding, foliar spray Carbandizim +Mancozeb @ 2g/L of water management of leaf spot and blight disease, application Emamectin benzoate @4gm/10L of water for management of pod borer, application of thiomethoxm 2ml/L of water for sucking pest like aphid and jassid	25	20	Asha	18.9	7.5	14.2	9.7	46.4	32300	58200	25900	37000	85200	48200	2.3
Nayagarh	PRG 176	Variety PRG 176 , seed treatment with Carbandizim + Mancozeb @ 2gm/kg of seed, Basal application of Zymite Plus as Soil conditioner, application of Thiodoprid 240 SC @0.5ml/l of water, application of Carbendazim 12%+ Mancozeb 63% WP@2gm/l of water, application of Emamectin Benzoate 5% SG @0.4gm/l of water	25	10	Kandula	15.07	9.98	12.52	9.13	37.1	31671	55425	23754	44502	93900	49398	2.11



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (q/ha)	% increase over existing	Farmer's Existing plot			Demonstration plot				
						Max.	Min.	Av.			Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	
Rayagada	PRG 176	Variety : PRG 176, Seed treatment with Thiram @ 3g/kg seed. For control of heavy weed infestation application of pre-emergence weedicide Pendimethalin @ 2.5 L/ha, Integrated Pest Management by application of imidacloprid @ 140 ml/ha for control of sucking pest, Profenofos @ 1L/ha for control of leaf webber and Pheromonone trap with heliure @ 20 nos./ha for control of pod borer	25	10	Local (Beda Kandula)	15.8	13.3	14.5	9.7	49.5	32000	61110	29110	1.91	35750	92610	56860	2.59
<b>Sub-Total</b>			<b>344</b>	<b>150</b>		<b>13.73</b>	<b>9.80</b>	<b>11.77</b>	<b>8.55</b>	<b>37.6</b>	<b>30719.0</b>	<b>54028</b>	<b>23420</b>	<b>1.8</b>	<b>37681</b>	<b>78169</b>	<b>39376</b>	<b>2.1</b>
<b>West Bengal</b>																		
Jhargram	ICP-8863	Variety: ICP-8863, Seed treatment with <i>Trichoderma viridi</i> , <i>Rhizobium</i> , PSB	31	10	UPAS-120	14.5	11	12.75	7.5	70.0	34500	64200	30500	1.95	57600	118600	61000	2.21
Purulia	LRG-41	Variety : LRG-41, Seed rate @ 20kg/ha; Seed Treatment- <i>Trichoderma viride</i> @ 200gm/ha and <i>Pseudomonas</i> @ 200gm/ha; Biofert. <i>Rhizobium</i> @ 2kg/ha; and PSB @ 2kg/ha; Application of fertilizer- 30kg N and 100 kg P2O5/ha, Application of micronutrient- Zn @ 25kg/ha, Plant Protection: Gram pod borer ( <i>Helicoverpa armigera</i> )-Azadirachtin 3 ml/L, wilt ( <i>Fusarium udum</i> )-Seed treatment with 4 gm <i>Trichoderma viride</i> .	29	10	DeshiRaher	11.1	9.2	10.2	5.3	92.5	16900	33100	16200	1.95	22300	49400	27100	2.21



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (q/ha)	% increase over existing	Farmer's Existing plot			Demonstration plot			
						Max.	Av.	Min.			Gross return (Rs/ha)	Gross Cost (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross return (Rs/ha)	Gross Cost (Rs/ha)	Net Return (Rs/ha)
Murshidabad (Addl)Sargachi	Laxmi	Variety : Laxmi , Line sowing, Seed treatment- <i>Trichodarmaviridae</i> - 4g/kg, Soil application- Azotobacter + PSB@ 200g each and foliar application of B@ 2g/L of water and soil application 7.5 kg/ha	35	10	Local	15	14.3	13.6	15.5	22.6	30900	66000	35100	76000	31500	44500	2.41
<b>Sub-Total</b>			<b>95</b>	<b>30</b>		<b>13.53</b>	<b>12.41</b>	<b>11.26</b>	<b>9.4</b>	<b>48.2</b>	<b>27433</b>	<b>54433</b>	<b>27267</b>	<b>81333</b>	<b>37133</b>	<b>44200</b>	<b>2.19</b>
<b>Total</b>			<b>439</b>	<b>180</b>		<b>14.5</b>	<b>12.9</b>	<b>11.3</b>	<b>9.0</b>	<b>43.17</b>	<b>29076</b>	<b>54231</b>	<b>25344</b>	<b>79751</b>	<b>37407</b>	<b>41788</b>	<b>2.13</b>

**Crop Name: Blackgram**

Name of the KVK	Name of variety	Technology demonstrated	NO of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (q/ha)	% increase over existing	Farmer's Existing plot			Demonstration plot			
						Max.	Av.	Min.			Gross return (Rs/ha)	Gross Cost (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross return (Rs/ha)	Gross Cost (Rs/ha)	Net Return (Rs/ha)
Keonjhar	Vallabh Urd-1-1	Variety: Vallabh Urd-1-1. Seed inoculation with <i>Rhizobium</i> , post emergence application of Imazethapyr weedicide, application of Thiophanate methyl 70% WP to control bacterial leaf blight and application of Acetamiprid 4% + fipronil 4% to control insect pest	25	10	Local	6	5.65	5.3	4.2	34.5	21000	30200	9200	40300	26000	14300	1.55

Odisha



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			% increase over existing	Farmer's Existing plot				Demonstration plot		
						Max.	Min.	Av.		Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)
Nabaran-gapur	RU 03-04	Variety: RU 03-04, Line sowing (30X10 cm), STBFA dose of Fertilizer NPK 25:50:40 kg/ha, Foliar sprayed of multi micro-nutrients @ 2ml/L once at pre-flowing stage, applied Fungicide carbendazim 1.2% + mancozeb 6.3% @ 1.5 ml /lit for control of brown spot and other leafspot, applied insecticide@Deltamethrin1%+Trizaphos35%@ 2 ml /L to control pod borer & stem borer and Acetamiprid 20% @ 2 ml/L to control white fly.	50	20	Indis-crimnate local	7.4	6.6	7.1	44.9	29500	58800	29300	33100	85200	49800	2.57





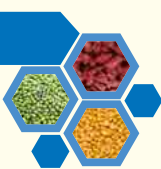
Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			% increase over existing	Farmer's Existing plot			Demonstration plot			
						Max.	Min.	Av.		Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)
Rayagada	RU-03-14	Variety: RU-03-14, Seed treatment <i>Rhizobium</i> @ 20g/kg of seed, INM (N:P:K @20:40:20 kg/ha, Znso4 12 kg/ha and Boron 10 kg/ha), post emergence weedicide application (Quizalofop Ethyl 5% EC @ 1 L/ha), spraying Acetamiprid 20%SP @ 125 g/ha for control of sucking pest and Profenophos @ 2ml/L of water for control of Tobacco Caterpillar. Integrated measures to control Yellow mosaic virus utilized Yellow Sticky Trap @ 20 nos./ha and spraying Imidacloprid 17.8% SL @ 140 g/ha	25	10	Local	8.2	7.4	7.8	25.8	22000	39060	17060	23500	49140	25640	2.09



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			% increase over existing	Farmer's Existing plot			Demonstration plot				
						Max.	Min.	Av.		Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Sundargarh-II	Indira	Variety: Indira, Seed rate-20kg/ha, Seed treatment with Carbendazim 50% @2g/kg of seed followed by Seed inoculation with Rhizobiumculture@20g/kg of seed, Line sowing spaced at 30X10 cm. Weed management by the application of Pendimethylene @3L/ha. Application of PSB @ 5 kg/ha . Micro nutrient application @12.5 kg/ha.Pest management by Imidacloprid 17.8 SL@125mg/ha &Profeonophos+Chloro @ 1L/ha	18	10	Mala Biri	7.7	5.8	6.75	40.6	22600	33600	11000	1.49	24400	44800	20400	1.84
<b>Sub total</b>			<b>118</b>	<b>50</b>		<b>7.33</b>	<b>6.28</b>	<b>6.83</b>	<b>35.8</b>	<b>23775</b>	<b>40415</b>	<b>16640</b>	<b>1.70</b>	<b>26750</b>	<b>54860</b>	<b>27535</b>	<b>2.05</b>
<b>West Bengal</b>																	
Bankura	PU-31	Replacement of Variety (from Sulata WBU 109 to PU-31) seed treatment with Carbendazim 50% and Mancozeb 50% @ 2g/kg seed, Foliar application of Micronutrient mix @ 1.5 ml/L of water, Use of Azadirachtin	65	10	Sulata	15	10	12.5	13.6	10000	30000	20000	1.5	14000	36000	22000	2.57



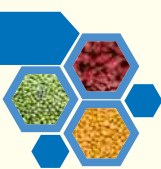
Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (q/ha)	% increase over existing	Farmer's Existing plot				Demonstration plot			
						Max.	Min.	Av.			Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Birbhum	PU-31	Variety: PU-31, application of Herbicides Pendimethalin as pre emergence @ 3l/ha, Micronutrient spray Boron-20 @ 2g/L water in 25 and 45 DAS	73	20	Kali-50	13.05	8.7	10.9	6.2	75.8	17925	37200	19275	2.07	18875	65400	46525	3.46
Coochbehar	PU-31	PU-31 + integrated nutrient management	30	20	Local	9.79	9.49	9.64	6.9	39.7	25118	40227	15109	1.6	28310	59438	31128	2.09
D. Dinajpur	Sulata	Sulata, Boron, bio-fertilizer, line sowing	50	20	Local	9.6	7.3	8.45	6.6	28.0	16900	24300	7400	1.43	17800	35900	18100	2.02
Jalpaiguri	PU 31	Variety: PU 31, Application of agricultural lime to reclaim the soil condition, Seed treatment: <i>Rhizobium</i> @ 5 gm per kg seed, Two foliar spray of Boron 20% @ 1-2 gm/L of water & Zinc EDTA @ 05 gm/L of water @ 40 and 55 days after sowing improves pod formation & pod size, Spraying of 5% Neem Seed Kernel Extract for the control of pod borer, Need based application of Chloropyrifos 50% + Cypermethrin 5% EC @ 1.5-2.0 ml per L of water at podding stage pre-emergence application of Pendimethalin 30% EC @ 0.75 kg a.i. / ha at 1-5 DAS.	69	20	Local	8.81	6.89	7.58	6.0	26.3	23800	37500	13700	1.57	24450	46996	22546	1.92



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Exist- ing yield (q/ha)	% in- crease over existing	Farmer's Existing plot				Demonstration plot			
						Max.	Min.	Av.			Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Re- turn (Rs/ha)	B:C ratio
Malda	PU-31	Variety:PU-31 , Seed treatment with <i>Rhizobium</i> culture treatment , Soil treatment , PSB spray + Micronutrient spray , Insect Management and Disease Management	75	30	Maskalai	13.13	8.48	11.18	6.65	68.1	16190	36901	20711	2.3	19711	61507	41796	3.13
						12.8	10.2	11.5	10	15.0	30100	48480	18380	1.6	30500	56160	25660	1.8
						12.6	10.4	11.5	10	15.0	30100	48480	18380	1.6	30500	57120	27350	1.9
Nadia	IPU-02-43	Variety: IPU-02-4 , Seed treatment, Bio-fertilizer, Humic and Fulvic acid, PPC	65	10	Sarada	12.7	10.3	11.5	10	15.0	30100	48480	18380	1.61	30500	56640	26505	1.86
						15.75	12.37	14.06	9	56.2	21600	41400	19800	1.92	22875	64676	41801	2.83
Murshidabad	PU-31	Introduction of Variety-PU-31.	64	20														
North 24 Parganas	Sulata	Variety :Sulata, Seed treatment with <i>Rhizobium</i> @ 1.5 kg/ha, Application of Insecticide Imidachlorprid and Chlorpyrifos @ 1.5ml/L at flowering and pod development stage, application of fungicide Copper Oxychloride at active growth stage and fruiting stage, Application of pre emergence herbicide Pendimethalin @ 750 g ai/ha	76	20	Local, Sarada	10.95	4.32	9.37	6.88	36.2	23500	37840	14340	1.61	26500	60905	34405	2.3



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			% increase over existing	Farmer's Existing plot				Demonstration plot			
						Max.	Min.	Av.		Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Purba Medinipur	IPU-02-43	Seedtreatment, PPC, IN-M, Bio-fertilizer Variety : PU-31, Seed rate @25kg/ha, Seed treatment- <i>Trichoderma viride</i> @200gm/ha and <i>Pseudomonas</i> @ 200gm/ha; Biofert. <i>Rhizobium</i> @2kg/ha; and PSB @ 2kg/ha; Fertilizer application of 30kg N and 100 kg P2O5/ha, Application of Micro-nutrient- Zn @25kg/ha, Plant Protection: Bihar hairy caterpillar ( <i>Spilarcha tibialiqua</i> ): Azadirachtin: 3 ml/L Yellow mosaic virus.	114	10	Local	4.35	3.65	4.00	27.0	10500	17100	6600	1.62	11200	23400	12200	2.08
Purulia	PU-31		34	10	Deshi Biri	11.45	10.24	10.45	75.6	17264	33488	16224	1.94	26170	61955	35640	2.36



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			% increase over existing	Farmer's Existing plot			Demonstration plot				
						Max.	Min.	Av.		Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Uttar Dina-jpur	PU-31, IPU-2-43	Replacement of old variety of seed, seed treatment with <i>Rhizobium</i> @ 20 g/ kg of seed followed by <i>Trichoderma</i> @ 4g/ kg of seed at 7 days interval, Soil application of bio-fertilizer like <i>Azotobacter</i> , <i>Azospirillum</i> and PSB @ 2 kg/ acre, Application of Propaquizalofop @ 2.0 ml/L as post-emergence herbicides after 15-20 days, Application of boron as micronutrient @ 2.0 g/L of water at 25, 45-50 and 75-85 DAS, Application of chloropyrifos @ 2.5ml/L at 15 DAS and choloryiphos + cypermethrin mixture @ 1.5 ml/L during pod formation for pest management	121	20	Local	10.51	8.61	9.56	21.0	28600	59250	30650	2.07	30100	71700	41600	2.38
Murshidabad (Addl) Sargachi	PU-31	Variety : PU-31, Seed treatment- <i>Trichoderma viridae</i> - 4g/kg, Soil application- Azotobactor + PSB@ 200g each, and foliar application of micronutrient mixture @ 2g/Lof water and soil application of boron @ 7.5 kg/ha	35	10	Local	11	9	10	42.9	23500	42500	19000	1.8	26600	60000	33400	2.25
<b>Total</b>			<b>1046</b>	<b>280</b>		<b>9.28</b>	<b>7.34</b>	<b>8.38</b>	<b>37.4</b>	<b>22080</b>	<b>38907</b>	<b>16827</b>	<b>1.77</b>	<b>24802</b>	<b>54527</b>	<b>29446</b>	<b>2.21</b>



**Crop Name: Green gram**

Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			% increase over existing	Farmer's Existing plot				Demonstration plot				
						Max.	Min.	Av.		Gross return (Rs/ha)	Gross Cost (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross return (Rs/ha)	Gross Cost (Rs/ha)	Net Return (Rs/ha)	B:C ratio	
<b>Odisha</b>																		
Boudh	IPM-02-14	Variety: IPM-02-14, Seed treatment with carboxin+thiram; Application of herbicides (pendimethalin 2.5L/ha) Application of Imidacloprid @0.4 ml/L control sucking pest attack	25	10	Jhainmoog	7.5	5.7	6.7	5.7	17.5	27650	37100	9450	20200	46900	17700	1.34	1.6
Ganjam-II	Virat	Variety: Virat, Seed treatment - <i>Trichoderma viridae</i> @ 5gm/kg seed , Foliar spraying of N-P-K(19-19-19) @25kg/ha & micro nutrient 25L/ha for better flowering, spraying of Sulphur 90% @40kg/ha for better growth of root, Spraying of Neem Oil @2.5ml/L to prevent the insect & pest, Spraying of Profenophos+Cypermethrin @ 1ml/L for control of jassids& other insects, Spraying of Indoxacarb @ 1 ml/ L of water for controlling pod borer problems & use of pro supper gunny bag for storage of seeds	25	10	Local	5.4	4	4.8	3.6	33.3	12900	21600	8700	13600	28800	15200	1.67	2.11



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (g/ha)	% increase over existing	Farmer's Existing plot				Demonstration plot			
						Max.	Min.	Av.			Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Sonepur	IPM-02-14	Variety:IPM-02-14, Seed rate-20 kg/ha, seed treatment with <i>Rhizobium</i> 20g/kg seed, gyp-mite plus 100kg/ha, Quizalofopthyle 5% EC 800 ml/ha at 2-3 leaf stage for control of narrow leaf weeds, Thiomethoxam 25% WG @0:3g/L for management of whitefly, Sulfex 80% WP 2.5kg/ha for control of powdery mildew, indoxacarb + Novaluron 875ml/ha for control of Helocoverpaandspodoptera, Imazethapyr 10% SL@750ml/ha for control of broad leaved weeds.16 DAS	35	20		8.3	6.7	7.5	5.9	27.1	15370	26800	16780	19875	37375	17500	1.7	1.9
Kalimpong	SML 668	Variety:SML 668 with seed treatment <i>Rhizobium</i> 25 gm/kg seed + Neem oil spray @3ml/L water.	25	10	Local (Paheli)	10.1	6.3	8.18	5.17	58.2	20100	31020	10920	21950	49,080	27130	1.54	2.23
	Purulia	IPM-02-14	34	10	Deshi Moong	9.6	8.1	8.63	5.5	56.9	17630	33935	16305	27570	66070	38500	1.92	2.39

West Bengal





Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			% increase over existing	Farmer's Existing plot				Demonstration plot			
						Max.	Min.	Av.		Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Murshidabad (Addl) Sargachi	Virat	Variety: Virat, Line sowing, Seed treatment- <i>Trichoderma viridae</i> - 4g/kg, Soil application of Azotobactor + PSB@ 200g each and foliar application of B@ 2g/L of water and soil application 7.5 kg/ha	35	10	Local	11.5	11	11	9.0	24500	47700	23200	1.94	26800	58300	31500	2.17
<b>Total</b>			<b>179</b>	<b>70</b>		<b>8.73</b>	<b>6.89</b>	<b>7.80</b>	<b>5.81</b>	<b>19692</b>	<b>33026</b>	<b>14226</b>	<b>1.68</b>	<b>21666</b>	<b>47754</b>	<b>24588</b>	<b>2.20</b>

### Yield of Summer Pulses 2021-22

#### Crop Name: Blackgram

Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			% increase over existing	Farmer's Existing plot				Demonstration plot			
						Max.	Min.	Av.		Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Birbhum	PU-01	Variety: PU-01, application of herbicides Pendimethalin as pre emergences @3L/ha, micronutrient spray Boron-20 @2gm/L water at 25 and 45 DAS	71	10	Kali-50	8.5	12.2	7.2	69.44	16650	34100	17450	2.04	17700	67100	49400	3.79
Murshidabad	PU 31	Introduction of Improved variety PU-31	64	20	Sarada(W-BU-108), Gou-tam(105)	11.25	13.12	9	45.78	22200	52200	30000	2.35	24750	76125	51375	3.08

West Bengal



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Exist- ing yield (q/ha)	% in- crease over exist- ing	Farmer's Existing plot			Demonstration plot				
						Max.	Av.	Min.			Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Murshidabad (Add) Sargachi	PU 31	Variety: PU-31, Seed treatment- <i>Trichodarma- viridae</i> - 4g/kg, Soil application- <i>Azotobacter</i> + PSB@ 1.5 kg each/ ha, and foliar application of B@ 2g/L of water and soil application 7.5 kg/ha	60	20	Local	13.92	12	13	10	30.3	23500	50000	26500	2.13	26580	65000	38480	2.45
			<b>195</b>	<b>50</b>		<b>13.89</b>	<b>10.60</b>	<b>12.78</b>	<b>8.73</b>	<b>46.37</b>	<b>20783</b>	<b>45433</b>	<b>24650</b>	<b>2.19</b>	<b>23010</b>	<b>69408</b>	<b>46418</b>	<b>3.02</b>
<b>A &amp; N Islands</b>																		
Port Blair			10															
<b>Grand total</b>			<b>195</b>	<b>60</b>														
Not conducted																		

### Crop Name: Greengram

Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Exist- ing yield (q/ha)	% in- crease over exist- ing	Farmer's Existing plot			Demonstration plot				
						Max.	Min.	Av.			Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Birbhum	IPM-205-07 (Virat)	Variety: IPM-205-07 (Virat), Herbicide application of Pendimethalin as pre emergence @ 3L/ha and micronutrient spray Boron-20 @2gms/L water at 25 and 45 DAS	92	10	Panna	13.3	9.15	12.7	8.0	58.8	19900	48000	28100	2.4	21200	76200	55000	3.59
			<b>92</b>	<b>10</b>														
<b>West Bengal</b>																		



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (q/ha)	% increase over existing	Farmer's Existing plot				Demonstration plot			
						Max.	Min.	Av.			Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Hooghly	IPM-205-07 (Virat)	Variety: IPM205-7 Seed treatment with <i>T. viridae</i> (@ 5g/kg seed), <i>Rhizobium</i> inoculation (@ 600g/acre), Boron(20%) application @ 2g/ L of water, Application of Liquid Sulphar (33%)@3ml/L of water, Application of Imidachloprid 17.8 SL @0.3ml/L of water for mosaic, Application of BT @3g/L of water for pod borer.	97	20	Local	12	7.4	10.1	7.2	40.28	25800	46800	21000	28125	65650	37525	2.33	
Howrah	IPM-205-07 (Virat)	Variety: IPM205-7 , Application of Imidachloprid 17.8 SL @ 0.3ml/L of water for mosaic, Application of Chlorpyrifos + Cypermethrin (@ 2ml/L for controlling insect, Spraying of Mancozeb @2.5g/L water	76	20	Local	12.8	8.7	10.7	6.8	57.35	27750	47520	19770	29800	68700	38900	2.31	
South 24 Parganas Nimpith	IPM 205-7(Virat)	Variety:IPM205-7 , Seed inoculation with <i>Rhizobium</i> , PSB & KSB @1.5 kg/ha each , foliar spray of micro nutrient (B, Mo & Zn) @ 2g/L of water at flowering stage , Spraying of Chlorfenapyr 10 % SC @1000 ml/ha	142	30	Choiti Moong	10.2	9.15	9.61	7.95	20.88	26875	48495	21620	30375	57660	27285	1.90	



Name of the KVK	Name of variety	Technology demonstrated	No of farmers	Area (ha)	Existing (Farmer's) variety name	Yield obtained (q/ha)			Existing yield (q/ha)	% increase over existing	Farmer's Existing plot				Demonstration plot			
						Max.	Min.	Average			Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
Uttar Dinaipur	IPM 2-14	Variety:IPM 2-14, Seed treatment with <i>Rhizobium</i> @ 20 g/kg of seed followed by <i>Trichoderma</i> @ 4g/ kg of seed at 7 days interval, Basal application of <i>Rhizobium</i> @ 0.5 kg/ha ,Azotobacter and PSB @ 4 kg/ ha,Application of Pendi-mathalin 30 EC @ 2.0 ml/L as pre-emergence herbicides and Propaquizafop @ 2.0 ml/L as post-emergence herbicides in 2 clusters, Application of Boron as micronutrient @ 2.0 g/L of water at 25, 45-50 DAS, need based application of insecticide and fungicide	92	20	Local	14.38	12.44	13.41	9.26	44.82	28800	69450	40650	2.4	31400	100575	69175	3.2
<b>Total</b>			<b>499</b>	<b>100</b>		<b>12.54</b>	<b>9.37</b>	<b>11.3</b>	<b>7.84</b>	<b>44.15</b>	<b>25825</b>	<b>52053</b>	<b>26228</b>	<b>2.02</b>	<b>28180</b>	<b>73757</b>	<b>45577</b>	<b>2.62</b>
<b>A&amp; N Islands</b>																		
N& M Andaman	CARI Moong 2	Varietal trial of CARI Moong 2	03	0.5	Local	-	-	2.15	1.10	95.4	26000	65420	39420	2.52	28000	96775	68775	3.46
Port Blair																		
<b>Total</b>				<b>100.5</b>														



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