

Clustered Frontline Demonstration on Pulses (2019-20)

Frontline demonstrations in pulses were planned in *kharif*, *rabi* and *summer* season in the state of Odisha, West Bengal and A & N Islands. The project was funded by NFSM, DAC& FW, New Delhi. In the year 2019-20, an area of 1300 ha was covered through 3175 demonstrations. An amount of Rs. 261.90 lakh was sanctioned and Rs.132.4 lakh was received by ATARI Kolkata. Out of these 1300 ha, 1195 ha area has been achieved by conducting 3018 demonstration. In *kharif* season 630 ha was covered by crops like pigeon pea, black gram and green gram. In *rabi* season, lentil chickpea, field pea, horse gram, green gram and black gram was demonstrated in 340 ha. In summer season the demonstration taken up in 330 ha. The details on state wise coverage of area are given below table 1.

The results of the frontline demonstration in pulses showed that in pigeon pea. The demonstrated yield was 12.09 q/ha in Odisha, which recorded 39% increase in yield. In West Bengal pigeon pea recorded 10.14 q/ha of yield which is also 39% higher than local checks. The pigeon pea varieties *PRG176* and *LRG-41* were put under demonstration and technology like seed treatment bio-fertilizers etc. were demonstrated in this crop. Net return from the crop were in the range of Rs. 23722/- to Rs. 28435/- per ha.

In black gram, demonstrated yield was 6.98 q/ha in Odisha and 11.17 q/ha in West Bengal. The yield improvement was 33% in Odisha and 48% in West Bengal. In black gram varieties like *PU-31*, *Sulata (WBU-109)* and *IPU-02-43* were demonstrated in *kharif*. Technologies like seed treatment micronutrient, bio-fertilizers were demonstrated under the programme. Net return are in the range of Rs. 19593/- per ha to Rs.47325/- per ha depending upon varieties. The B : C ratio was in the range of Rs. 17700/- per ha to Rs. 38240/- per ha in this crop.

In *rabi* season, major crop was lentil, the crop was demonstrated in 325 ha only in West Bengal. The average demonstrated yield was 9.92 q/ha against 7.40 q/ha in local check, the increase was 34.1%. The lentil mainly *WBL 77 (Moitree)* was the ruling variety in these demonstrations. Full package, micronutrients (Zn and Boron) etc. were demonstrated in the demonstrations. The demonstrations showed Rs. 29473/- per ha net return with B : C ratio of 2.25.

Chick pea is another important *rabi* pulse which was demonstrated in Odisha 50 ha and 75 ha in West Bengal. The average demonstrated in yield in Odisha was 10.25 q/ha and in West Bengal 12.92 q/ha. The increase in yield was 38% in Odisha and 27% in West Bengal. Economics of demonstration showed that the net return were Rs. 31210/ha to Rs. 54280/ha in varieties like *JU-14* and *JAKI-9218*. Seed treatment, bio-fertilizers etc. were the components of demonstration in chickpea. Field pea, horse gram in 25 ha each in the state of Odisha and West Bengal. Increase in yield in field pea was 24-25%. In horse gram increase was 42%. In field pea variety *Prakash* and *Pusa Pragati* were demonstrated.

Green gram demonstration was achieved in 225 ha in Odisha in *rabi* season. Black gram was demonstrated in 100 ha in Odisha in *rabi* season. In green gram increase in yield was about 4%. The average demonstrated yield in green gram was 7.2 q/ha which is almost double than local check. The varieties *IPM-02-03* and *IPM-02-14* were demonstrated. In black gram demonstrated yield was 6.39 q/ha and yield increment was 30%. Black gram varieties *PU31* and *IPU-02-43* were demonstrated. In *summer* season, green gram was demonstrated in 250 ha in Odisha, 250 ha in West Bengal. The large area coverage by these crop, resulted in popularization of varieties like *IPM-02-03*, *IPM-02-14*, *IPM 250-7 (Virat)* and *Pusa Vishal*. In black gram varieties like *PU 31*, *WBU-109* were demonstrated which increased 10.24 q/ha yield in West Bengal and 5.4 q/ha yield in Odisha. The improvement was 42% in Odisha and 57% in West Bengal.

A & N Islands took up demonstration on 30 ha in green gram and 20 ha in black gram. The average demonstrated yield was 9.5 q/ha in green gram and 8.1 q/ha in black gram in A & N Islands. The improvement was 59% in green gram and 4% in black gram. Green gram variety *CARI-1, 2, 3, 4* and black gram varieties *CARI-1* and *82* were used in the demonstration.

Frontline demonstration conducted under NFSM

Sl. No	Crops	State	Target of FLDs approved		Achievements of FLDs		Average yield (q/ha)		Yield increase (%)	Difference of yield between demo and local (q/ha)
			No. of Demos	Area (ha)	No. of Demos	Area (ha)	Demo	Local		
Kharif season										
1	Pigeon pea	Odisha	575	230	575	230	12.09	8.7	39.02	3.39
		West Bengal	50	20	50	20	10.14	7.29	39.09	2.85
2	Black gram	Odisha	475	190	475	190	6.98	5.24	33.21	1.74
		West Bengal	375	150	338	135	11.17	7.57	47.6	3.6
3	Green gram	Odisha	75	30	75	30	6.9	4.85	42.27	2.05
		West Bengal	25	10	25	10	8.45	5.5	54.54	2.95
Total			1575	630	1538	615				
Rabi season										
1	Lentil	West Bengal	325	130	325	120	9.92	7.4	34.14	2.41
2	Chick pea	Odisha	50	20	50	20	10.25	7.41	38.26	2.84
		West Bengal	75	30	75	20	12.92	10.15	27.29	2.99
4	Field pea	Odisha	25	10	25	10	13.65	11	24.1	2.65
		West Bengal	25	10	25	10	23.69	18.95	25	4.74
5	Horse gram	Odisha	25	10	25	10	5.71	4.01	42.39	1.7
6	Green gram	Odisha	225	90	225	90	7.22	4.93	46.45	1.66
7	Black gram	Odisha	100	40	100	40	6.39	4.91	30.14	1.3
Total			850	340	850	320				
Summer Season										
1	Green gram	Odisha	250	100	250	100	7.55	5.38	40.31	2.17
		West Bengal	250	100	250	100	11.43	8.31	37.5	3.12
		A& N Islands	150	60	30	12	9.5	5.97	59.13	3.53
2	Black gram	Odisha	50	20	50	20	5.4	3.8	42.11	1.6
		West Bengal	50	20	50	20	10.24	6.5	57.46	3.74
		A& N Islands	75	30	20	8	8.1	5.54	46.21	2.56
Total			750	330	630	260				
Grand Total (kharif + rabi + summer)			3175	1300	3018	1195				

Result of CFLD on Pulses during 2019-20

S	Variety	Technology demonstrated	Area (ha)	No. of farmers	Farmer Practice (q/ha)	Yield		Economics of Local Check (Rs./ha)				Economics (Rs./ha)	
						Demo (q/ha)	Gross Cost	Gross return	Net return	BC ratio	Gross Cost	Gross return	Net Return
on													
ap	PRG-176	Seed treatment, biofertilizer, (<i>Rhizobium</i>) and PSB	230	3718	8.70	12.09	24229	41619	17390	1.75	28435	58609	30174
ap	LRG-41	line sowing ,seed treatment Rhizobium culture, Vermicom post 2t /ha,	20	77	7.29	10.14	18111	34719	16608	1.92	23722	51967	28244
gra	PU 31 (Odisha)	Seed treatment, Rhizobium Culture, premergence weedicide, RDF & IPM	190	466	5.24	7.0	18834	31256	12423	2	21043	40709	19594
gra	PU-31 (WB)	Seed treatment with Rhizobium @ 1.5 kg/ha,application of pre emergence herbicide,	104	398	7.96	11.22	21839	44538	22700	2.03	25888	61686	41794
gr	Sulata(WBU-109)	Micronutrient sprayof Boron at 25 and 45 DAS	10	61	5.60	10.95	17325	33600	16275	1.94	18375	65700	47324
gr	IPU-02-43	Variety, Seed treatment, Bio-fertilizer, PSB, Micronutrient	21	100	10.80	12.00	29500	48600	20100	1.64	30250	57600	27354
gr	IPM-02-03(Odisha)	Line sowing 30cmx10cm, Seed treatment with Rhizobium culture,STBF,	10	25	5.5	6.7	27650	37100	9450	1.34	20200	46900	17704
gr	IPM-02-14(Odisha)	Seed treatment with chemicals, application of plant protection chemical	20	81	4.2	7.32	13690	25660	11970	1.84	18780	37800	18724
gr	IPM-02-14(WB)	Seed Treatment-Trichoderma viride @200g/ha and Pseudomonas @ 200g/ha; Biofert. Rhizobium @2kg/ha; and PSB @ 2kg/ha;	10	50	5.5	8.45	17030	32820	15790	1.92	25660	63900	38244

Variety	Technology demonstrated	Area (ha)	No. of farmers	Farmer Practice (q/ha)	Yield		Economics of Check (Rs./ha)			Local Gross Cost	Economic Demo (Rs.)
					Dem (q/ha)	Gross Cost	Gross return	Net return	BC ratio		
Green gram CARI-1,2,3,4	Improved variety with bioinputs	12	64	5.97	9.5	35700	47760	12700	1.34	42300	76000
IPM-02-03 (Odisha)	Line planting 30 cm row spacing, seed treatment with Rhizobium, Soil application of biofertiliser, foliar spray of Boron t 30 ,45DAS	10	25	5.48	7.5	15800	32400	17900	2.0	17000	45000
IPM-02-14 (Odisha)	line sowing(25cm x10cm) , seed treatment with chemicals	90	134	5.63	8.04	20025	36563	16538	1.83	23111	49138
IPM 205-7(Virat)	Variety IPM 205-7(Virat),Seed inoculation with Rhizobium @1.5 kg/ha, Foliar spray of Micro nutrient (B, Mo & Zn) @ 2g/lit.of	50	274	7.53	9.52	23473	42548	19075	1.78	24340	56992
Pusa Vishal	Variety Pusa Vishal, Seed treatment with bio fertilizer Rhizobium @ 10gm/kg of seed	10	25	13.8	18.19	39000	55200	16200	1.41	42500	72760
IPM 2-14(WB)	Varietal replacement (IPM 2-14), Bio-stimulant 0.3 ml/L, Micronutrient @ 1.5 gm/L at 30 & 50 DAS	30	75	7.11	10.65	23430	41316	14793	1.7	24617	56173
IPM-02-3(WB)	Summer -Green gram Var: IPM-02-3+ Herbicides pendimethalin as pre emergences @ 3lt/ha+ Micronutrient spray Boron-20 @2gm/lt water in 25 and 45 DAS	10	62	8.0	10.82	19700	48000	28300	2.44	20900	73500
		212	659								
CARI-1, CARI-2	Improved variety of Black Gram CARI-1,CARI-2 with bio inputs	8	40	5.54	8.1	35700	44320	8620	1.24	42300	64800
PU 31 (Odisha)	Variety: PU-31,Line sowing ,25x10 cm,Seed inoculation with Rhizobium @ 20 gm/kg seed,RDF 20:40:20 kg NPK / ha	20	30	3.8	5.4	6500	19000	12500	2.92	79000	27800
PU 31(WB)	Var: PU-31+ pendimethalin as pre emerg @ 3lt/ha+ Micronutrient spray Boron-20 @2gm/lt water in 25 and 45	10	47	6.2	11.25	16450	34100	17650	2.07	17500	67100

Variety	Technology demonstrated	Area (ha)	No. of farmers	Farmer Practice (q/ha)	Yield		Economics of Check (Rs./ha)			Local Gross Cost	Economic Demo (Rs.)
					Demo (q/ha)	Gross Cost	Gross return	Net return	BC ratio		
	DAS										
WBU-109(WB)	WBU-109, Integrated nutrient management	10	25	6.8	9.22	24380	35866	11486	1.47	27479	58332
(mer)		48	142								

