

Frontline demonstrations - Annual Progress Report: 2022-23

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Executive summary

During *Kharif* 2022-23, 300 frontline demonstrations (FLDs) on small millets were organized across country viz., Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu and Uttarakhand on farmer's fields. Latest varieties of small millets were demonstrated with local cultivar as a check in farmers' fields along with improved package of practices at different locations. The demonstrated technologies under front line demonstrations of finger millet, foxtail millet, kodo millet, little millet, barnyard millet and proso millet gave 39.69 %, 36.99%, 36.48%, 55.26%, 39.35% and 53.04%, respectively higher grain yields and 31.11%, 38.44%, 32.62% 21.72%, 43.70% and 68.34%, respectively fodder yield than the farmers practice and were found economically beneficial.

Detailed report

Introduction

Front Line demonstrations (FLDs) is a unique approach to provide a direct interface between researcher and farmers as the scientists are directly involved in planning, execution and monitoring of the demonstrations for the technologies developed by them and get direct feedback from the farmer's field about the crops. This enables the scientists to improvise upon the research programme accordingly. The purpose of Front-Line Demonstrations was to demonstrate the full potential available in the recommended package. So, it was necessary to provide all key inputs (Seed of HYV's, suitable to the region and recommended dose of manures free of cost to the cultivator). Thus, FLDs provide an opportunity to researchers for understanding the farmer's resources and requirement to fine tune and/or modify the technologies for easy adaptability at farmers' fields.

Working on the principle of "Seeing is believing" FLD's serves as a very valuable medium for educating farmers as well as for training of field extension functionaries. Realizing this, the Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India and the Indian Council of Agricultural Research, jointly initiated the conduct of Front-Line Demonstrations (FLD's) under the aegis of All India Coordinated Research project on Small

Millets (AICRP on Small Millets). Keeping these in view, FLDs on Small millets were organized during *Kharif* 2022-23 at different locations of the country.

Implementation of frontline demonstrations during 2022-23

Front Line Demonstrations were conducted during 2022 in the states of Andhra Pradesh, Karnataka, Tamil Nadu, Chhattisgarh, Maharashtra, Madhya Pradesh, Uttarakhand and Gujarat on farmer's fields. The total area under Front Line Demonstrations was 300 ha of which 135 ha was in finger millet, 35 ha in kodo millet, 45 ha in foxtail millet, 55 ha in little millet, 25 ha in barnyard millet and 5 ha in proso millet. Both centre and crop wise breakup of area covered under Front Line Demonstrations during the period is provided in Table 1 and centre and crop wise breakup of FLD farmers are presented in Table 2. Whereas, Table 3 and 4 shows the state and crop wise breakup of area and farmers number, respectively. The cooperative and well responsive farmers from different categories were selected from the villages of each site. The detailed technical programme organized and the progress during 2022-23 is given here under.

Table 1: Centre and crop wise breakup of area covered (hectares) under FLDs during 2022-23

S. NO.	Center	FM	FTM	LM	KM	PM	BM	Total Area. ha
1	P.C. unit	20	5	-	5	-	-	30
2	VPKAS Almora	10	-	-	-	-	10	20
3	Mandya	20	-	-	-	-	-	20
4	Hagari	-	10	-	-	-	-	10
5	Nandyal	-	20	-	-	-	-	20
6	Vizianagaram	15	-	10	-	-	-	25
7	Jagdalpur	15	-	5	10	-	-	30
8	Athiyandal	5	5	5	5	5	5	30
9	Ranichauri	10	-	-	-	-	10	20
10	Dindori	-	-	15	15	-	-	30
12	Kolhapur	15	5	10	-	-	-	30
13	Kanke	15	-	-	-	-	-	15
14	Waghai	10	-	10	-	-	-	20
	Total	135	45	55	35	5	25	300

Table 2: Centre and crop wise breakup of farmers covered under FLDs during 2022-23

S. NO.	Center	Finger millet	Foxtail millet	Little millet	Kodo millet	Proso millet	Barnyard millet	Total No of farmers
1	P.C. unit	44	11	-	10	-	-	65
2	VPKAS Almora	290	-	-	-	-	290	580
3	Mandya	49	-	-	-	-	-	49
4	Nandyal	-	20	-	-	-	-	20
5	Vizianagaram	30	-	10	-	-	-	40
6	Jagdalpur	36	-	13	26	-	-	75
7	Athiyandal	5	5	5	5	5	5	30
8	Ranichauri	168	-	-	-	-	169	337
9	Dindori	-	-	48	35	-	-	83
10	Kolhapur	75	-	-	-	-	-	75
11	Kanke	64	-	-	-	-	-	64
12	Waghai	109	-	85	-	-	-	194
	Total	870	36	161	76	5	464	1612

The total number of farmers involved was 1612 (Table 2). Number of front-line demonstrations conducted in small millets in different states (Table 4) indicated that there were 870 farmers involved in finger millet demonstrations during 2022 across the country followed by barnyard millet (464), little millet (161), Kodo millet (76), foxtail millet (36)

and proso millet (5). The main purpose of this activity was to demonstrate the yield potential that could be attained by adopting the improved cultivation practices.

Table 3: State and crop wise breakup of area covered (hectares) under FLDs during 2022-23

State	Finger Millet	Foxtail Millet	Little millet	Kodo millet	Proso millet	Barnyard millet	Total area (ha)
Karnataka	40	15	-	5	-	-	60
Uttarakhand	20	-	-	-	-	20	40
Andhra Pradesh	15	20	10	-	-	-	45
Madhya Pradesh	-	-	15	15	-	-	30
Tamil Nadu	5	5	5	5	5	5	30
Maharashtra	15	5	10	-	-	-	30
Chhattisgarh	15	-	5	10	-	-	30
Jharkhand	15	-	-	-	-	-	15
Gujarat	10	-	10	-	-	-	20
Total area (ha)	135	45	55	35	5	25	300

Table 4: State and crop wise breakup of farmers covered under FLDs during 2022-23

State	Finger millet	Foxtail millet	Little millet	Kodo millet	Proso millet	Barnyard millet	Total no. farmers
Karnataka	93	11	-	10	-	-	114
Uttarakhand	458	-	-	-	-	459	917
Andhra Pradesh	30	20	10	-	-	-	60
Madhya Pradesh	-	-	48	35	-	-	83
Tamil Nadu	5	5	5	5	5	5	30
Maharashtra	75	-	-	-	-	-	75
Chhattisgarh	36	-	13	26	-	-	75
Jharkhand	64	-	-	-	-	-	64
Gujarat	109	-	85	-	-	-	194
Total	870	36	161	76	5	464	1612

Demonstrated small millet cultivars and improved package of practices

Most of the demonstrations were conducted by adopting the whole package for latest national and state released small millets were demonstrated and compared with locally popular varieties as a check (LC). The varieties under the FLDs during *kharif* 2022-23 are given in Table 5.

Table 5: Improved varieties demonstrated under FLDs

State	Finger millet	Foxtail millet	Little millet	Kodo millet	Proso millet	Barnyard millet
Karnataka	GPU 66 KMR-630, KMR-301	DHFT 109-3, HN-46	-	TNAU-86	-	-
Uttarakhand	VL-352, VL-379	-	-	-	-	VL 207 PRJ-1
Andhra Pradesh	VR-929, VR 1101, (Indravathi)	SIA 3156 SIA 3088	BL-6	-	-	-
Madhya Pradesh	-	-	JK-4	JK-137	-	-
Tamil Nadu	ATL-1	ATL-1	ATL-1	ATL-1	ATL-1	CO(KV) 2
Maharashtra	Phule Nachani	-	-	-	-	-
Chhattisgarh	Indira Ragi-1, CG Ragi-2	-	CG Kutki-1 CG Kutki-2	Indira Kodo -1, CG Kodo-2,	-	-
Jharkhand	BBM-10(BM-3)	-	-	-	-	-
Gujarat	CFMV-3	-	GNV-3	-	-	-

Results

Grain, Fodder yields and economics of small millet cultivation

The results indicated (Table 6, 7, 8,9,10 and 11) that (on mean location basis)

1. The demonstrated technologies of finger millet under FLDs yielded (39.69 per cent increase) grains and 31.11 per cent more fodder than the farmer's practice. In results, the higher benefit-cost (B: C) ratio (2.91) was obtained from them as compared to the check (2.32).
2. The data on grain and fodder yields obtained from demonstrated varieties of Foxtail millet under FLDs which were organized by PC Unit, Bengaluru, Nandyal and Athiyandal indicated that yielded 36.99 per cent more grains and 38.44 per cent more fodder with B: C ratio of 2.77 compared to the farmers practice (2.33).
3. Demonstrated varieties of Kodo millet performed better in terms of grain (36.48%) and fodder yield (32.62 %) under FLD which had more B: C ratio (2.58) compared to farmers practice (2.28).
4. The data on grain and fodder yields of little millet obtained from demonstrated varieties under FLDs yielded 55.26 per cent more grains and 21.72 % more fodder yield than the farmer practice. It shows that the demonstrated technologies were also good as per the fodder yield is concerned compared to the local check.
5. Performance of demonstrated varieties of Barnyard millet in the Almora, Athiyandal and Ranichauri was found better and gave 39.35 per cent higher grain and 43.70 per cent fodder yield than the local check.
6. In Athiyandal area of Tamil Nadu, demonstrated variety along with other improved package of Proso millet performed better and gave 53.04 per cent higher grain and 68.34 per cent higher fodder yield than the farmers practice.

Impact of the frontline demonstrations

The results revealed (Table 6, 7, 8,9,10 and 11) that the grain yield of finger millet (1657 kg/ha), foxtail millet (1385 kg/ha), kodo millet (1245 kg/ha), little millet (955 kg/ha), barnyard millet (1330 kg/ha) and proso millet (903 kg/ha) was lower under local practice as compared to FLDs (2314, 1897, 1699, 1483, 1853 and 1382 kg/ha, respectively) indicating wide gap of 39.69, 36.99, 36.48, 55.26, 39.35 and 53.04 per cent respectively, across the states. Moreover, in case of fodder was also found wide yield gap. The net returns obtained under FLDs was Rs.47641, 37221, 33880, 32232, 44160 and 22486 per ha, of finger millet, foxtail millet, kodo millet, little millet, barnyard millet and proso millet, respectively.

Per cent yield gap in small millets across the centres							
S. NO.	Center	Finger millet	Foxtail millet	Kodo millet	Little millet	Proso millet	Barnyard millet
1	P.C. Unit, Bengaluru	19.94	20.63	12.50	-	-	-
2	VPKAS Almora	53.62	-	-	-	-	55.22
3	Mandya	28.11	-	-	-	-	-
5	Nandyal	-	44.58	-	-	-	-
6	Vizianagaram	30.98	-	-	58.06	-	-
7	Jagdalpur	73.59	-	74.58	40.27	-	-
8	Athiyandal	23.27	47.21	31.36	41.82	98.62	19.18
9	Ranichauri	41.22	-	-	-	-	46.22
10	Dindori	-	-	57.70	77.04	-	-
11	Kolhapur	44.74	-	-	-	-	-
12	Kanke	91.09	-	-	-	-	-
13	Waghai	37.29	-	-	62.49	-	-
	Mean	39.69	36.99	36.48	55.26	98.62	39.35

Table -6 : Grain yield (kg/ha), fodder yield (kg/ha) and economics of finger millet : 2022-23

Centre name	Grain Yield (kg /ha)		Fodder yield (kg/ha)		Gross return (Rs./ha)		COC (Rs./ha)		Net return (Rs./ha)		B:C ratio	
	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP
PC unit, Bengaluru	2250	1876	4012	3377	76500	63784	25100	22320	51400	41464	3.05	2.86
Almora	2120	1380	5040	3470	44768	29335	21165	25342	23603	3993	2.12	1.16
Mandya	2648	2067	4452	3824	67585	53284	39674	43626	27911	9658	1.70	1.22
Vizianagaram	2583	1972	5823	6017	95331	73555	25785	20619	69546	52936	3.70	3.57
Jagdalpur	1413	814	2655	1556	49295	28431	23495	20300	25800	8131	2.10	1.40
Athiyandal	3390	2750	5200	4120	104419	84607	26986	23550	77433	61057	3.87	3.59
Ranichauri	1850	1310	4480	3040	69081	48420	16560	12300	52521	36120	4.17	3.94
Kolhapur	2200	1520	3080	2230	65612	45435	30945	23910	34667	21525	2.12	1.90
Kanke	2618	1370	4712	2534	86394	56600	19500	17700	66894	38900	4.43	3.20
Waghai	2069	1507	5184	3826	67270	46648	20639	18696	46631	27952	3.26	2.50
Mean	2314	1657	4464	3399	72626	53010	24985	22836	47641	30174	2.91	2.32

Table -7 : Grain yield (kg/ha), fodder yield (kg/ha) and economics of foxtail millet: 2022-23

Centre name	Grain Yield (kg /ha)		Fodder yield (kg/ha)		Gross return (Rs./ha)		COC (Rs./ha)		Net return (Rs./ha)		B:C ratio	
	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP
PC Unit, Bengaluru	1725	1430	2932	2280	60375	50050	18380	16756	41995	33294	3.28	2.99
Nandyal	2439	1687	4568	3258	59749	41422	17815	15000	41934	25987	3.35	2.68
Athiyandal	1528	1038	2364	1587	54676	37137	26941	23550	27734	13587	2.03	1.58
Mean	1897	1385	3288	2375	58267	42870	21045	18435	37221	24434	2.77	2.33

Table -8: Grain yield (kg/ha), fodder yield (kg/ha) and economics of Kodo millet: 2022-23

Centre name	Grain Yield (kg /ha)		Fodder yield (kg/ha)		Gross return (Rs./ha)		COC (Rs./ha)		Net return (Rs./ha)		B:C ratio	
	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP
PC Unit, Bengaluru	1764	1568	2998	2613	61740	54880	18590	17630	43150	38250	3.32	3.11
Jagdalpur	1243	712	2088	1358	39373	22718	19898	17005	21374	8213	2.19	1.57
Athiyandal	2333	1776	3603	2720	83449	63520	27241	23050	56208	40470	3.06	2.76
Dindori	1454	922	1654	1108	36558	23235	19870	14550	16688	8685	1.84	1.60
Mean	1699	1245	2586	1950	55280	41088	21400	18059	33880	23030	2.58	2.28

Table -9: Grain yield (kg/ha), fodder yield (kg/ha) and economics of little millet :2022-23

Centre name	Grain Yield (kg /ha)		Fodder yield (kg/ha)		Gross return (Rs./ha)		COC (Rs./ha)		Net return (Rs./ha)		B:C ratio	
	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP
Vizianagaram	1745	1104	6056	6404	51888	34114	16227	12766	35661	21348	2.20	1.68
Jagdalpur	923	658	1855	1288	29540	21038	15333	14130	15058	8708	2.04	1.71
Athiyandal	1726	1217	2689	2127	61754	42566	26941	20050	34813	22516	2.29	2.17
Dindori	1234	697	1287	878	53110	30157	18870	13650	34240	16507	2.81	2.21
Waghai	1789	1101	5380	3489	60870	38002	18629	17656	42241	20346	2.27	1.15
Mean	1483	955	3453	2837	51432	33175	19200	15650.4	32232	17525	2.68	2.12

Table -10: Grain yield (kg/ha), fodder yield (kg/ha) and economics of Barnyard millet: 2022-23

Centre name	Grain Yield (kg /ha)		Fodder yield (kg/ha)		Gross return (Rs./ha)		COC (Rs./ha)		Net return (Rs./ha)		B:C ratio	
	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP
Almora	2080	1340	4850	3480	65627	43729	21164	23148	46885	14582	2.1	0.7
Athiyandal	1740	1460	3127	2467	62568	52459	27241	23550	35327	28909	2.30	2.22
Ranichuri	1740	1190	5670	3550	69249	46350	16560	12300	52689	34050	3.18	2.77
Mean	1853	1330	4549	3166	65815	47513	21655	19666	44160	27847	3.04	2.42

Table -11: Grain yield (kg/ha), fodder yield (kg/ha) and economics of proso millet: 2022-23

Centre name	Grain Yield (kg /ha)		Fodder yield (kg/ha)		Gross return (Rs./ha)		COC (Rs./ha)		Net return (Rs./ha)		B:C ratio	
	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP	FLD	FP
Athiyandal	1382	903	2143	1273	49427	32255	26941	23550	22486	8705	1.83	1.37

Conclusion

Demonstrated small millet varieties along with improved package of practices yielded higher grain and fodder than the farmers practice and were found economically superior to farmers practice.