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Impact of cluster frontline demonstrations on productivity of sesame during summer in Chhattisgarh plains

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Abstract

Cluster Frontline Demonstration is a form of applied research to demonstrate the latest high yielding varieties along with full package of practices on cluster basis in farmers' fields with a view to show the potentiality and feasibility of the technologies to the participating farmers, neighbouring farmers and to analyze the production performance of the technologies for scientific feedback. Cluster Frontline Demonstrations on Oilseeds were organized by 5 KVKs namely Raipur, Bilaspur, Gariyaband, Mahasamund and Balod from 2017-18 to 2021-22 during summer season. a total of 270CFLDs had been performed overlaying an area of 140ha underneath Sesame, an crucial oilseed crop of the place. productivity of oilseeds realized in FLDs changed into higher than the district average indicating ability for bridging the yield gap. consequences of CFLDs on Sesame have proven encouraging potentials. it'll also assist in breaking yield plateau to acquire manufacturing of sufficient quantity of oilseed to meet in line with capita availability of oilseed for making sure dietary protection and agro-ecological sustainability. total 05 KVKs of Chhattisgarh were actively worried in conductance of CFLDs. The major technology targeted inside the demonstration of Sesame had been introduction of suitable and high yielding sorts, technique of sowing, seed remedy, line sowing, integrated nutrient control and included pest management. Beneath this programme 140 ha region turned into protected with demonstration of oilseed across 05 districts from 2017-18 to 2021-22. Through out 2017-18, a total of forty four CFLDs were specified in 40 ha vicinity, in 2018-19, 38 CFLDs were laid out in 20 ha region, all through 2019-20, 50 CFLDs had been specified in 20 ha area, in 2020-21, 125 CFLDs had been specified in 50 ha vicinity and in 2021-22, 13 CFLDs were specified in 10 ha area. In Cluster Frontline Demonstrations for the duration of last 05 years a median yield of four.72 q/ha was received which became seventy three% better than the farmers yield.

Keywords: Cluster frontline demonstrations (CFLD), Benefit cost ratio (BCR), Minimum support price (MSP), Krishi Vigyan Kendra(KVK), Phosphate solubilising bacteria (PSB), Integrated nutrient management (INM), Agricultural technology application research institute (ATARI)

Introduction

Edable oils occupy a unique area in Indian society, subculture, nutritional styles and economy of the u. s.. because of various agro-climatic situations and geographical places, farmers are able to develop the entire 9 annual oilseeds viz. groundnut, mustard, soybean, sunflower, sesame, safflower, niger, castor and linseed. Oilseeds are the rich supply of strength, containing two times as a great deal power (9 kcl/g) as carbohydrate or protein (4 kcl/g), (FAO, 1997) [2]. In India, oilseeds are the second most critical crop after cereals sharing 14 in line with cent of the u.s. Gross cropped vicinity and accounting for almost three in keeping with cent of the gross home product (GDP). fee sensible, oilseeds constitute nearly 6 in step with cent of the price of all agricultural merchandise. India grows oilseeds on an area of almost 27 million hectares with productiveness of 1368 kg in keeping with hectare. In take of vegetable oils is growing gradually due to the lifestyle adjustments in nutritional pattern and increasing in keeping with capita earnings. Like pulses, oilseeds additionally face extreme demanding situations in phrases of climatic stresses and destructive farming conditions, oilseeds cultivation is specially undertaken on marginal land by way of useful resource bad farmers who are generally reluctant to offer vital inputs for growing the productiveness. Almost, eighty two in line with cent vicinity of oilseeds cultivation fall below rain fed farming wherein climatic vagaries purpose excessive damage to crops.

Oilseeds additionally face a plethora of challenges. India is considered one of the most important producers of oilseeds in the international and contributes about 6-7% of the sector oilseeds production. although, India ranks amongst leading producers of oilseeds within the international which is close to 10 consistent with cent, majority of oilseed manufacturing comes from rainfed regions, because of insect infestation and other troubles farmers don't take hobby in cultivation of oilseeds. on the same time, India is lucky in having a huge variety of oilseed crops grown in its distinctive agro-climatic zones. Groundnut, mustard, sesame, safflower, linseed, niger seed, castor are the primary historically cultivated oilseeds. Our general intake of fit to be eaten oils is between one hundred eighty-190 lakh tonnes yearly. 50-60 percent of this requirement is met thru imports, bulk of that is inside the shape of palm oil imported from Indonesia and Malaysia. Ten top oil seed developing states account for ninety three in step with cent acreage and 96 consistent with cent production. Contribution of remaining states is negligible.

Govt. of India had started generation assignment on Oilseeds in 1986 which has been transformed right into a country wide task on Oilseeds and Oil Palm (NMOOP) in 2014. This gave a thrust to authorities's efforts for augmenting the manufacturing of oilseeds. That is evident by means of the growth within the manufacturing of oilseeds from about 11.3 million tonnes in 1986-87 to 36.56 million tons in 2020-21.

Vicinity underneath cereals, pulses and oilseeds has multiplied in Chhattisgarh. In cereal vegetation the vicinity below summer paddy and wheat has elevated drastically, in case of oilseeds, vicinity underneath sesame and groundnut has elevated notably. Maize, horse gram, mustard and nigerare the essential vegetation in Bastar plateau, whilst wheat, mustard, linseed, sesame, niger & black gram are the most important vegetation in northern hill sector. Sugarcane accompanied by way of groundnut and maize are the main Zaid (summer time) vegetation in Chhattisgarh.

Till date, the productivity stage of oilseeds is not satisfactory resulting from numerous biotic and abiotic stresses besides unavailability of exceptional seeds of progressed types in time and poor crop control practices because of unawareness and non-adoption of recommended manufacturing and plant protection technology. There fore, it's far critical to illustrate the high yielding types, immune to biotic and abiotic stresses and different production technologies to which the farmers commonly do no longer adopt. A extensive hole exists between the to be had strategies and its real implementation with the aid of the farmers that's pondered thru poor yield within the farmers' fields. there are so many appropriate technology generated at agricultural universities and research stations however the productiveness of oilseeds continues to be very low due to poor switch of generation from the points of its development to the factors of its usage and simplest a touch new expertise percolates to the farmers fields hence, a considerable hole has been observed among understanding manufacturing and understanding utilization. To gain target of extra production of oilseeds, Cluster Frontline Demonstration (CFLD) of oilseeds on farmer's subject can be beneficial. The simple objective of this programme is to demonstrate advanced verified technology of these days launched, early maturing, high yielding, varieties in a compact clusters with nutrient management, weed control and pest management at farmers subject to usher in better software of present day technologies to show high yield. retaining this in view, demonstrations have been conducted in 0.four ha every to evaluate technological gap and production advantage on a few selected oilseed and pulse crops as according to the suitability of district needs and farmer's desire.

Frontline Demonstrations in oilseeds below CFLD have been initiated related to KVKs throughout the nation. Farmers are figuring out capacity of oilseed vegetation thru these demonstrations and are adopting these remunerative plants in big scale.

Materials and Methods

India's economy has been dominated by agriculture. However, Indian agriculture fiercely depends on monsoon to yield sufficient agricultural returns. India's major food crops rice and wheat have been heavily incentivized with MSP in addition to preferential treatment of Public Distribution System to benefit the Indian poor. Hence, Indian farmers are motivated to grow either these crops or cash crops like cotton, sugarcane etc. Pulses and oilseeds have been a second choice for the farmers for cultivation.

Over a period of time, a number of improved oilseed varieties and production technologies have been developed, but full potential of these varieties as well as technologies could not be exploited due to low rate of adoption and low yields. Thus, factors limiting the productivity cannot be overlooked. It may emphasize on quality attributes, adoption and popularization of new agro technology, evolving better varieties for stress conditions and improving present yield potential. The aim of these demonstrations in general is to raise production through transfer of farm technology.

Cluster front line demonstrations (CFLDs) is one of the most powerful tool of extension because farmers, in general, are driven by the perception that "Seeing is believing". Cluster Front Line demonstration (CFLD) is a unique approach to provide direct interface between scientist 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 farmers about the crops in general and technology being demonstrated in particular. This enables the scientists to improvise upon the research programme accordingly. CFLDs provide an opportunity to researchers and extension personnel for understanding the farmer's resources and requirement to fine tune and/or modify the technologies for easy adaptability at farmers' fields.

Frontline Demonstration is a form of applied research through university system on latest released varieties along with critical inputs on selected farmers' fields with a view to demonstrate the potentiality of the technologies to (a) participating farmers (b) neighbouring farmers and other agencies; (c) to analyse the production (d) performance of the technologies for scientific feedback.

Objectives

The main objective of cluster frontline demonstrations is to demonstrate newly released crop production and protection technologies and its management practices in the farmer's field under the micro-farming situation.

Selection of site and beneficiary

- The sites of demonstrations selected were easily accessible to attract large number of farmers for more impact, easy monitoring and feedback.
- Technologies selected were of paramount importance and preferred by farmers.
- To create better and visible impact of a technology, the demonstrations were conducted in cluster approach of at least cluster of 10.0 hectares. One demonstration at individual farmer was not less than 0.4 hectare and not exceeding to one hectare.
- Demonstrations of improved variety and technology were planned well before time.
- Demonstrations were conducted on farming situations for scientific interpretation.

Beneath the ICAR sponsored scheme on oilseed production and safety technology, KVKs of Indira Gandhi Krishi Vishwavidyalaya, Raipur performed cluster front line demonstrations on extraordinary oilseed crops at some point of kharif season from 2017-18 to 2021-22. The Krishi Vigyan Kendras prepared CFLDs in diverse villages of worried districts of KVKs. A listing of farmers became organized from organization meeting and training become imparted and soil checking out changed into performed of the fields wherein technology needed to be verified to the selected farmers regarding exceptional aspects of encouraged production and protection technology. Assessment of gap in adoption of advocated era had been also recognized earlier than laying out the cluster frontline demonstrations (CFLD’s) through private discussion with decided on farmers.

The technological interventions on oilseed crops were constructed from appropriate stepped forward sorts and proven role of essential inputs viz. proper tillage, right seed price, time of sowing and sowing method, seed treatment, utility of biofertilizers, weed management and improved plant safety degree have been applied at farmers' fields. control plot (farmers practice) became additionally saved wherein farmers practices have been completed (use of non-descriptive types, broadcasting sowing approach, no need of fertilizer and seed treating chemicals, no hand weeding and indiscriminate use of plant safety measures). important inputs for the technologies to be tested were allotted to the farmers after the education like progressed excessive yielding variety, encouraged chemical substances and literature etc and normal visit, tracking and pest and disease advisory services management by way of the KVK scientist to the demonstration farmers.

The demonstrations on farmers' fields had been monitored with the aid of scientists of Krishi Vigyan Kendra and officers of Indira Gandhi Krishi Vishwavidyalaya, Raipur right from sowing to harvesting and made to manual them. Ultimately, field day become conducted concerning demonstration protecting farmers, other farmers in the village, and scientists from college and officers from branch of Agriculture to illustrate the prevalence of the era for every crop. Those visits have been also utilized to gather comments information for similarly development in studies and extension programme. The yield data were collected from the demonstrations and manipulate plots and analysed with the ideal equipment for different parameters.

Crop yield turned into recorded from the demonstration and manage plots for the vegetation at the time of harvest. The maximum viable way via which this can be completed is by way of demonstrating the endorsed progressed generation on the farmer’s fields via the front line demonstrations with the goals to work out the input price and monetary returns among the front line demonstrations and farmers strategies, to discover the yield gaps between farmer’s practices and frontline demonstrations. The fundamental statistics became recorded from the farmer’s field and analysed to comparative overall performance of cluster frontline demonstrations (CFLD’s) and farmer’s practice. The yield records had been accrued from each the demonstration and farmers’ exercise.

Results and Discussion

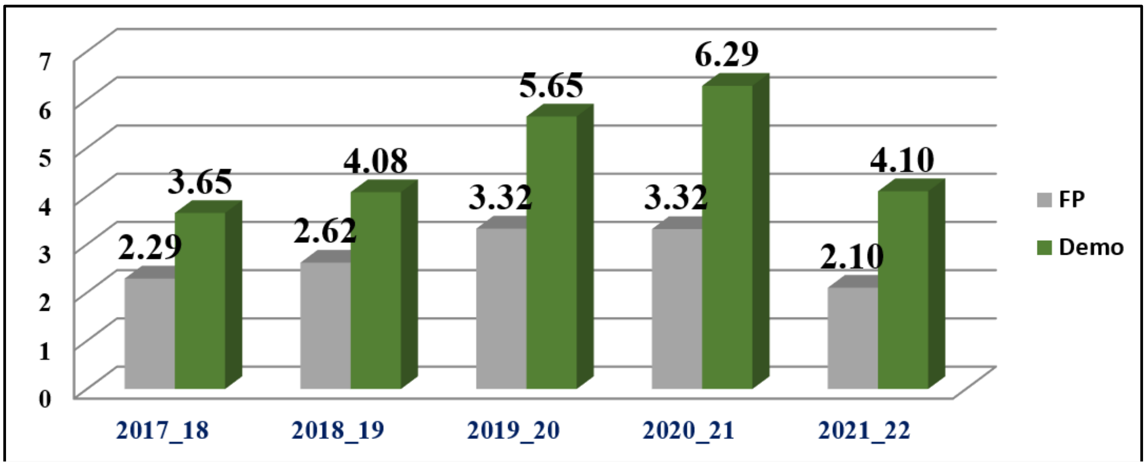
Sesame is an important oilseed crop, valued not only for its oil quality but also being an important source of nutrient, it is consumed directly or as an ingredient of other food items. In Chhattisgarh though sesame is cultivated as a Kharif crop, it is also grown as a summer crop under irrigated conditions. It is a less preferred crop among the farmers owing to a low average yield of 2.73 q/ha recorded by the farmers. In order to demonstrate the superiority of technological practices over existing practices and enhance the farmers yield, a total of 270 CFLD’s were laid out in 140 ha area. Over a period of 5 years an average yield of 4.72 q/ha was obtained which was 73% higher than the farmers yield. The farmers fetched average net return of Rs. 18198/ha over farmers practice (Rs. 7543/ha). The data given in the above table also reveals that during the last 5 years there has been a horizontal spread of the demonstrated technology in 503 ha area comprising of the districts of Raipur, Mahasamund, Balod, Bilaspur and Gariaband. The data also indicate that over the years yield gap was minimized in different districts recording an average yield gap of 20.95% over district average yield.

Table 1: Performance of CFLD (Oilseed) on Sesame during Summer 2017-18 to 2021-22

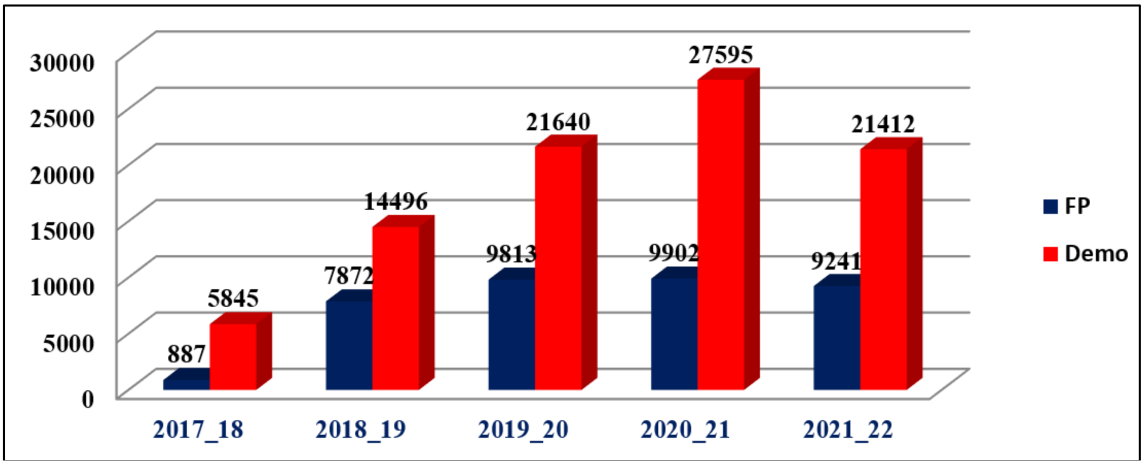
Year	KVK's	Variety	No. of Demos	Area (Ha)	Yield (q/ha)		Yield increase in (%)	Net Returns (Rs/ha)		B:C ratio		District Yield (q/ha)	Yield gap in (%)	Horizontal spread of technology (Ha)
					FP	Demo		FP	Demo	FP	Demo			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2017_18	Gariaband	NT-11	44	40	2.29	3.65	59%	887	5845	1.08	1.43	2.86	21.64	12
Tot./Avg.			44	40	2.29	3.65	59%	887	5845	1.08	1.43	2.86	21.64	12
2018_19	Raipur	TKG-308	25	10	3.24	5.67	75%	9747	19932	1.93	2.29	3.50	38.27	40
	Bilaspur	TKG-308	13	10	2.00	2.49	25%	5998	9060	1.92	2.40	2.15	13.65	53
Tot./Avg.			38	20	2.62	4.08	50%	7872	14496	1.92	2.34	2.825	25.963	93
2019_20	Mahasamund	TKG-308	25	10	3.60	6.65	85%	12096	27625	2.08	2.78	4.28	35.64	35
	Raipur	TKG-308	25	10	3.05	4.65	52%	7529	15655	1.61	2.08	3.60	22.58	79
Tot./Avg.			50	20	3.325	5.65	69%	9813	21640	1.84	2.43	3.94	29.11	114
2020_21	Balod	Vibhuti-999	50	20	3.00	5.98	99%	8065	25493	1.65	2.64	5.80	3.01	58
	Mahasamund	TKG-308	25	10	3.60	6.56	82%	11178	29469	1.83	2.90	4.28	34.76	32
	Raipur	TKG-308	50	20	3.35	6.32	89%	10464	27824	1.84	2.80	5.01	20.73	105
Tot./Avg.			125	50	3.32	6.29	90%	9902	27595	1.77	2.78	5.03	19.50	195
2021-22	Bilaspur	TKG-306	13	10	2.10	4.10	95%	9241	21412	3.2	4.60	3.75	8.54	89
Tot./Avg.			13	10	2.10	4.10	95%	9241	21412	3.20	4.60	3.75	8.54	89
G. Tot./Avg.			270	140	2.73	4.75	73%	7543	18198	1.96	2.72	3.68	20.95	503

Table 2: Year wise summary of sesame during summer

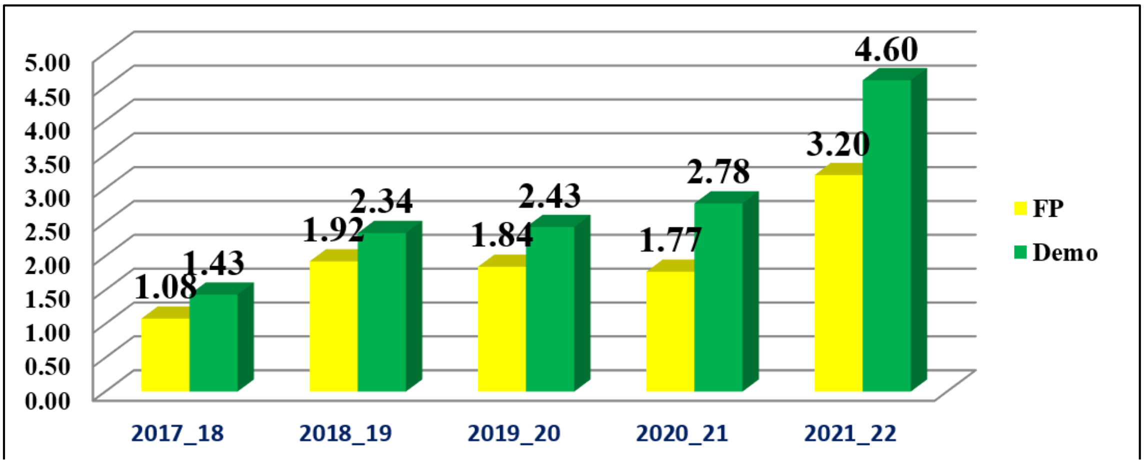
Year	No. of Demos	Area (Ha)	Yield (q/ha)		Yield increase in (%)	Net Returns (Rs/ha)		B:C ratio		District yield (q/ha)	Yield gap in (%)	Horizontal spread (ha)
			FP	Demo		FP	Demo	FP	Demo			
2017_18	44	40	2.29	3.65	59%	887	5845	1.08	1.43	2.86	21.64	12
2018_19	38	20	2.62	4.08	50%	7872	14496	1.92	2.34	2.82	25.96	93
2019_20	50	20	3.32	5.65	69%	9813	21640	1.84	2.43	3.94	29.11	114
2020_21	125	50	3.32	6.29	90%	9902	27595	1.77	2.78	5.03	19.50	195
2021_22	13	10	2.10	4.10	95%	9241	21412	3.20	4.60	3.75	8.54	89



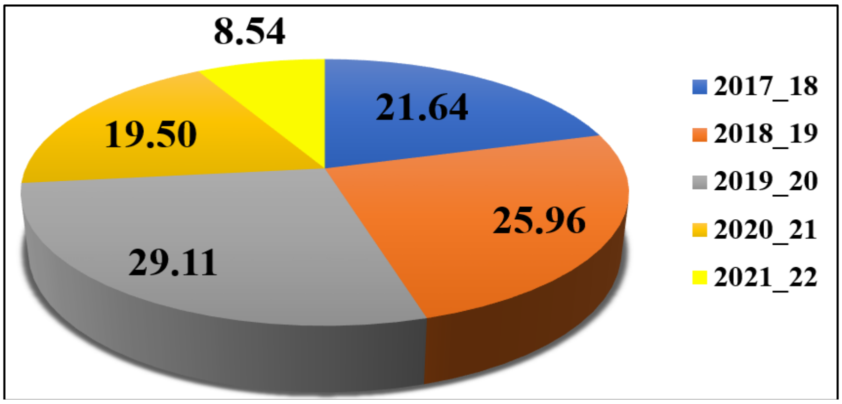
Year wise Yield (q/ha) of Sesame during Summer



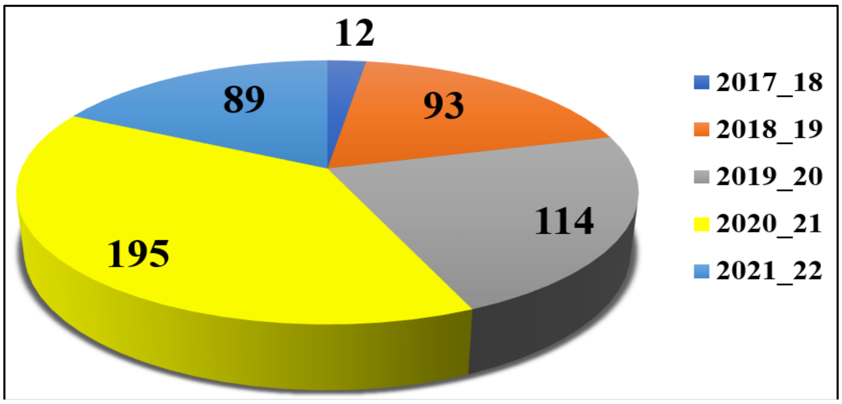
Year wise Net Returns (Rs/ha) of Sesame during Rabi



Year wise B:C ratio of Sesame during Summer



Year wise average Yield gap (%) of Sesame during Summer



Year wise Horizontal Spread of Technology of Sesame during Summer

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