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Impact of Cluster Frontline Demonstrations to Transfer of Technologies In Pulse Production Under NFSM

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ABSTRACT

Front line demonstration is an appropriate means for demonstration as well as transfer of improved agricultural innovations to the farming community. Under centrally sponsored scheme on pulses production technology under NFSM scheme, KVK, Rudrur has conducted front line demonstrations in farmer's fields during 2012 to 2017 in all 310 demonstrations on Green gram and Bengal gram crops in an area of 124 ha on the pulse production technology to transfer the latest technologies among the farmers of Nizamabad district. The findings in respect of Green gram (kharif seasons), the overall yield trend of 145 demonstrations in area of 58 ha ranged from 6.10 to 13.62 q/ha with an average of 8.82 q/ha and yield increase ranged from 10.45 per cent (in 2014-15) to 21.14 percent (in 2016-17) with an average of 16.67 per cent and Bengal gram (rabi seasons), the overall yield trend of 165 demonstrations in area of 66 ha ranged from 8.13 to 21.18 q/ha with an average of 15.05 q/ha and yield increase ranged from 7.10 per cent (in 2012-13) to 47.28 percent (in 2014-15) with an average of 21.37 per cent over the local farmers practices yield. Obviously, this can be attributed to improved technology as well as improved varieties. The yield levels were considerably low under local practices because of considerable variations in the extent of adoption of recommended package of practices depending upon the amount of risk involved in terms of cost, convenience, skill and knowledge about the concerned practice. The productivity was better over local practice under demonstrations. Hence, pulses production technology have a broad scope for increasing the area and production of pulses at each and every level i.e*., Farmers, State and National level.*

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INTRODUCTION

The Government of India had established a "Technology Mission on Pulses" in the year 1991- 92 with the objective to enhance the pulse production and productivity. The concept of first line demonstrations was put forth under this mission. These demonstrations are conducted under the close supervision of scientists of Krishi Vigyan Kendras, SAUs and their Regional Research Stations.

Over the last few years, the area and production of pulses in Telangana region of India was increased tremendously due to inception of Front Line Demonstrations concept at farmers' field. Field demonstration is a long term educational activity conducted in a systematic manner at farmers' fields to show worth of a new technology on "seeing is believing" idea. Traditional or farmers' practices are no longer sustainable towards pulses production as it shows unambiguous gap between traditional and scientific production technologies. Constant efforts are needed to bridge this gap through transfer of technology. To make stronger the extension services for educating the cultivators in the implementation of improved technology with availability of quality seed in time is the need of hour.

Over a period of time, a number of improved pulses varieties and production technologies have been developed, but full potential of these varieties as well as technologies could not be exploited due to lack of awareness on varieties, low rate of adoption and low yields. Pulses are the major source of protein when compared to cereals, oilseeds and other crops. Pulses production is mostly from the crop raised under rain-fed conditions. Cultivation of pulses in marginal lands, limited area of pulses under irrigated conditions, limited high yielding responsive varieties, pests and diseases and processing loss up to 6-8 per cent are some of the problems in the stagnation of pulses production over decades.

Thus, factors limiting the productivity cannot be overlooked. Research and extension programmes need to be diverted to produce value additive pulses. 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 devices in general is to raise production through transfer of farm technology.

The efforts were taken with planning, execution and follow up action of the pulses production technology through front line demonstrations, the present investigation was therefore undertaken to ascertain the importance of demonstrations in pulses production technology in increasing the yield with an objective of providing nutritive diet and increase availability of pulses per capita.

MATERIALS AND METHODS

The technologies to be demonstrated for Green gram and Bengal gram were identified based on Participatory Rural Approach (PRA) technique. A group of co-operative farmers were identified based on their participation and feedback received during the preliminary survey and interactive meeting.

Frontline demonstrations were conducted by the Krishi Vigyan Kendra, Rudrur, in *kharif* and *Rabi* seasons in the farmer's fields of Nizamabad district during 2012-13 to 2016-17. All 310 demonstrations in 124 ha area were conducted by the active participation of farmers with the objective to demonstrate the improved technologies of pulses production potential in different villages.

A total area of 10-20 hectare in every year was fixed for the demonstration of technologies in Green gram and Bengal gram along with farmers practice as control plot. Pre-sowing trainings were organized involving the selected farmers in their village for the crops. Critical inputs for the technologies to be demonstrated (Table 1 & 2) were distributed to the farmers after the training like improved high yielding variety, recommended chemicals and literature and regular visit, monitoring and pest and disease advisory services management by the KVK scientist to the demo farmers. Finally field day was conducted involving demonstration holding farmers, other farmers in the village, Scientists from University and ATARI, officials from Department of Agriculture and local extension functionaries to demonstrate the superiority of the technology for each crop. Crop yield was recorded from the demonstration and control plots for the crops at the time of harvest.

The most feasible way by which this could be achieved is by demonstrating the recommended improved technology on the farmer's fields through front line demonstrations with the objectives to work out the input cost and monetary returns between front line demonstration and farmers methods, to identify the yield gaps between farmers practices and front line demonstrations.

Table: 1. Differences between technological intervention and farmers practices under FLD on Green gram

Particulars	Technological intervention in FLD	Farmers practices	Gap
Variety	LGG-460, WGG-37, WGG–42 and MGG-347	Local/own seed	Full gap
Seed rate	15-20 kg/ha	20-25 kg/ha	High seed rate
Seed treatment	Carbendazim @ 2g, Imidacloprid @ 5 ml/kg seed & Rhizobium @ 500 g/ha seed	No seed treatment	Full gap
Fertilizer dose	25 kg Urea & 300 kg SSP	No use of fertilizer	Full gap
Weed management	Pendimithalin @ 2.5 L/ha and one hand weeding @ 30-45 DAS,	Pendimithalin @ 2.5 L/ha	Partial gap
Plant protection	Need based timely spraying	Improper measures & bios spraying	Full gap

Table: 2. Differences between technological intervention and farmers practices under FLD on Bengal gram

Particulars	Technological intervention in FLD	Existing practices	Gap
Variety	JG-11 & NBeG-3	Local/own seed	Full gap
Seed rate	62.5 kg/ha	75 kg/ha	High seed rate
Seed treatment	Trichoderma viridae @ 5g/kg seed	No seed treatment	Full gap
Fertilizer dose/ha	25 kg Urea & 300 kg SSP	No use of fertilizer	Full gap
Weed management	Pendimithalin @ 2.5 L/ha and one hand weeding @ 30-45 DAS	Pendimithalin @ 2.5 L/ha	Partial gap
Plant protection	Need based timely spraying	Improper measures & bios spraying	Full gap

The yield data were collected from both the demonstration and farmers practice by random crop cutting method and analyzed by using simple statistical tools. The technology gap and technological index (Samui *et. al*., 2000) were calculated by using following formula as given below.

1. Technology gap = Potential yield – Demonstration yield

2. Technology Index= Potential Yield-Demonstration Yield X 100
Potential Yield

3. Percent increase yield= Demonstration yield - farmers yield X 100
Farmers yield

RESULTS AND DISCUSSION

Average yield recorded in Green gram under rain fed situation was ranged 6.10 to 13.62 q/ha with an average of 8.82 q/ha in FLD plots which was more than check plot wherein, the yield was varied from 5.34 to 12.32 q per ha with an average of 7.61 q per ha. The results indicated that the frontline demonstrations gave good impact over the farming community of Nizamabad district as they were motivated by the new agricultural technologies applied in the FLD plots. The fluctuations in overall yield of Green gram from 2012-13 to 2016-17 was due to the problem of high water table and weather conditions in Nizamabad district. The increment in yield over check was ranged between 10.45 per cent (in 2014-15) to 21.14 percent (in 2016-17) with an average of 16.67 per cent (Table 3).

Table: 3. Performance of Green gram under Frontline Demonstration and farmers practice (check) during *Kharif* season from2012-13 to 2016-17 (Pooled data)

Year	Demo Variety	No. of Demos	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio		Potential yield (q/ha)	Technology gap (q/ha)	Technology index (%)
				Demo	Check		Demo	Check			
2012-13	LGG-460	30	12	6.95	5.82	19.42	1.19:1	0.99:1	13.75	6.80	49.45
2013-14	WGG-37	30	12	6.10	5.34	14.23	1.17:1	0.88:1	13.75	7.65	55.64
2014-15	WGG-37	30	12	13.62	12.32	10.45	1.14 :1	0.88	13.75	0.13	0.95
2015-16	WGG - 42	5	2	6.85	5.80	18.10	1.39 :1	1.03 :1	12.5	5.65	45.20
2016-17	MGG-347	21	8.4	10.60	8.75	21.14	1.24:1	0.75:1	12.5	1.90	15.20
Average		**-**	**-**	**8.82**	**7.61**	**16.67**	**-**	**-**	**-**	**-**	**-**
Total		**145**	**58**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Average yield recorded in Bengal gram under rain-fed situation during *rabi* seasons was ranged 8.13 to 21.18 q/ha with an average of 15.05 q/ha in FLD plots which was more than check plot wherein, the yield was varied from 6.25 to 18.75 q per ha with an average of 12.15 q per ha. The increment in yield over check was ranged between 7.10 per cent (in 2012-13) to 47.28 percent (in 2014-15) with an average of 21.37 per cent (Table 4). The fluctuations in overall yield of Bengal gram from 2012-13 to 2016-17 was due to weather conditions and cultivated as rain-fed crop.

Table: Performance of Bengal gram under Frontline Demonstration and farmers practice (check) during *Rabi* season from 2012-13 to 2016-17 (Pooled data)

Year	Demo Variety	No. of Demos	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio		Potential yield (q/ha)	Technology gap	Technology index (%)
				Demo	Check		Demo	Check			
2012-13	JG-11	30	12	13.87	12.95	7.10	1.35 :1	1.32 :1	22.5	8.63	38.30
2013-14	JG-11	30	12	21.18	18.75	12.9	1.42 :1	1.32 :1	22.5	1.32	5.86
2014-15	JG-11	30	12	13.30	9.03	47.28	1.36:1	1.01:1	22.5	9.20	40.80
2015-16	JG-11	25	10	8.13	6.25	30.08	1.22 :1	0.47 :1	22.5	14.37	63.87
2016-17	NBeG-3	50	20	18.78	13.75	36.58	2.45:1	1.20:1	25.00	6.22	24.88
Average	**-**	**-**	**-**	**15.05**	**12.15**	**21.37**	**-**	**-**	**-**	**-**	**-**
Total	**-**	**165**	**66**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

The yields of pulses could be increased over the yield obtained under farmers practices (old variety, no use of the balanced dose of fertilizer, untimely sowing and no control measures adopted for pest management) of pulses cultivation.

CONCLUSION

It is concluded that the FLD programme is an effective tool for increasing the production and productivity of pulses and changing the knowledge, attitude and skill of farmers. The per cent increment in yield of pulses to the extent of 10.45 to 21.14 in Green gram and 7.1 to 47.28 in Bengal gram FLDs over the farmers practice created greater awareness and motivated the other farmers to adopt the improved package of practices of pulses. These demonstrations also built the relationship and confidence between farmers and scientists. The beneficiary farmers of FLDs also play an important role as source of information and quality seeds for wider dissemination of the high yielding varieties of pulses for other nearby farmers.

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