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# Evaluation of Front Line Demonstration of Pulses in Raebareli District

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## ABSTRACT

India is the major pulse producer country. Pulses fix atmospheric nitrogen through symbiotic action. Low productivity of traditional varieties of pulses are a cause of concern for farmer's at large. To overcome the problem of low yield, Krishi Vigyan Kendra, Raebareli has conducted Front line demonstrations in the different localities of Raebareli district. Cultivation of high yielding varieties of pulses viz. i.e. Blackgram variety Shekhar-1, 60.41 per cent, PU-31, 18.25 per cent, Greengram variety Meha (IPM-9925), 75.60 per cent, Shweta-46.00 per cent, Lentil variety KL-320, 69.70 and 38.84 per cent, KLS-218, 39.21 per cent, Gram variety KWR-108, 63.23 per cent and 71.37 per cent and Field pea variety KPMR- 400, 54.92 per cent more yield of pulse crops as compared to local check. The productivity gain under FLD over farmers practice created awareness and motivated the other farmer's to adopt scientific crops production and management.

**Keywords:** Extension gap, Front line demonstration, Pulses, Technology gap, Technology index

## INTRODUCTION

Globally India is the major pulses producer followed by the Canada, China, Myanmar and Brazil. The world's major pulse producing countries, which together account for half the global production India, Canada, China, Myanmar and Brazil. India is the largest producer of pulses, accounting for 25 per cent of global pulses production. In a country like India, pulses are the cheapest and concentrated source of dietary amino acids, where protein demand of vegetarian population is fulfilled through pulses, so it is also considered as "A poor man's meat". Pulses occupy unique position in the world of agriculture by virtue of its high protein content, which is almost double than that of cereals. They have a special role in meeting the protein requirement of predominantly vegetarian population. In addition to protein, pulses are also containing good quality lysine, tryptophan, ascorbic acid and riboflavin. Pulses are suitable for people with diabetes also for coronary heart disease and anemia as they regulate the cholesterol. The presence of bioactive compounds i.e. Photochemical and antioxidants, build up anti-cancer properties in pulses. Other than the suitability for human health, pulses are also good for environment. Pulse crops are considered as the wonderful gift of nature as they have an ability to fix the atmospheric nitrogen ($N_2$) there by helps in N cycling within the ecosystem. Besides $N_2$ fixation, incorporation of crop residue increases the microbial activity restores soil properties, carbon sequestration and thus provides suitability in crop production system.

With the above objective in view Krishi Vigyan Kendra, Raebareli conducted front line demonstrations (FLDs) on the improved package of practices in pulses production. Pulses are cultivated in the entire district and most of the area comes under semi arid condition. Its productivity is far below the potential yield due to lack of knowledge and adoption about new technologies.

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## METHODOLOGY

The present study was carried out by Krishi Vigyan Kendra, Raebareli during *Kharif* season from 2015-16 to 2017-18 (3 years) in the farmers field of 26 villages of 11 blocks in Raebareli district. In total 722 FLDs in 155.4 ha area in different locations were conducted. The soil type of demonstration field was alluvial with pH ranging from 7.5 to 8.5 and average rainfall 923 mm with mean maximum and minimum temperature 44.2°C and 2.3°C, respectively. About 90 per cent of rainfall is distributed during June to September. The component of demonstration under front line demonstrations comprised high yielding varieties viz. Black gram-Shekhar-1, PU-31, Lentil- KL-320, KLS-218, Greengram- Meha (I PM-9925), Shweta, Gram- KWR-108, Fieldpea-KPMR-400 and farmers' practice are given in Table 1.

In case of farmer's practices, existing practices being used by farmers were followed. Before conducting the demonstration, training to the farmer's of respective villages was imparted with respect to envisaged technology interventions, site selection, farmer's selection, layout of demonstration, farmer's participation etc. as suggested by Choudhary (1999). The farmer's were selected on the criteria that they were involved in pulse cultivation since last 5 years. In the present study the data on output of pulse crop were collected from FLD plots besides the data on local practices commonly adopted by the farmers of this region were also collected. The collected data were tabulated and analyzed by using statistical tools like frequency and percentage. To estimate the technology index, extension gap and technology gap the formulae were considered as suggested by Samui *et al.* (2000); Kadian *et al.* (2004); Sagar and Chandra (2004).

## RESULT AND DISCUSSION

Result of front line demonstrations indicated that the cultivation practices considered under FLD viz., use of improved varieties, proper seed rate, seed inoculation by rhizobium and PSB culture balance application of fertilizer, integrated pest management, irrigation and spraying of weedicides along with two hand weeding produced on an average of higher yield i.e. blackgram variety Shekhar-1, 60.41 per cent, PU- 31, 18.25 per cent, Green Gram variety Meha (IPM-9925, 75.60 per cent, Shweta-46.00

**Table 1: Description of technological intervention under FLD on pulses**

| Particulars | Technological intervention (T) | Farmers Practice (T) | Gap |
|---|---|---|---|
| Variety | Blackgram – Shekhar-1, P.U.-31 | Loca l & Old | Full Gap |
| | Greengram- Meha (IPM-9925), Shweta | Local & Old | Full Gap |
| | Lentil-KL-320, KLS-218 | Local & Old | Full Gap |
| | Chickpea-KWR-108 | Local & Old | Full Gap |
| | Fieldpea- KPMR-400 | Local & Old | Full Gap |
| Seed Rate | Blackgram/Green Gram- 15 kg/ha | 20-25 kg/ha | Partial Gap |
| | Lentil-35-40 kg/ha | 40-50 kg/ha | Partial Gap |
| | Chickpea/Fieldpea-75-80 kg/ha | 100-125 kg/ha | Partial Gap |
| Integrated Nutrient Management | N:P:K (20:60:20 kg/ha) +Rizhobium @ 5g /kg seed + PSB @ 5 g /kg + Gypsum @ 200 kg/ha at the time of field preparation | No use of fertilizer | Full Gap |
| Integrated Pest Management | Seed treatment with Trichoderma Viridae @ 5 g/kg seed + One spray of Proparicphos @1.5 lit/ha at the ETL | One-two spray of insecticide | Partial Gap |
| Irrigation | First irrigation at the time of branching and Second irrigation during pod formation | No Irrigation | Full Gap |
| Weed Management | Spray of Emizathyper @ 1000 ml/ha with Two hand weeding first at 20-25 days after sowing and second at 40 days after sowing | No spraying | Full Gap |

per cent, Lentil variety KL-320, 69.70 and 38.84 per cent, KLS-218, 39.21 per cent, Gram variety KWR-108, 71.37 per cent and 63.23 per cent and Field pea variety KPMR 400-54.92 per cent more yield of pulse crops as compared to farmers practices. The result of FLD led to motivation to adopt the improved agricultural technologies applied in the FLD plots. Yield of pulse crops however varied in different years which might be due to the other factors like soil moisture availability, climate conditions, disease and pest attack as well as the change in the location of trials. The high yielding varieties of pulse crops yielded higher as compare to local check.

The technology gap, the gap in demonstration yield over potential yield were found i.e. blackgram Variety Shekher -1, 7.3 q/ha, PU-31, 10.2 q/ha, Lentil variety KL-320, 3.4 q/ha and 2.45 q/ha, KLS-218, 5.8 q/ha, Green gram variety Meha 7.8 q/ha and Shweta 4.7 q/ha. Gram variety KWR-108, 0.8 and 1.75 q/ha and Field pea variety KPMR-400, 11.55 q/ha. Hence location specific recommendation appears to be necessary to bridge the gap between the yields of different varieties. The highest extension gap of 8.85 &8.6 q/ha was recorded in gram variety KWR-108 fallowed by field pea variety KPMR-400,7.25 q/ha & lowest 2.3 q/ha for greengram variety Shweta.

**Table 2: Grain yield, technology gap, extension gap and technology index of different pulse varieties**

| Year | Crop | Variety | Grain yield (q/ha) | | | % increase over FP | Technology gap (q/ha) | Extension gap (q/ha) | Technology index (%) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Potential | FLD | FP | | | | |
| 2015-16 | Blackgram | Shekhar-1 | 12-15 | 7.70 | 4.80 | 60.41 | 7.3 | 2.9 | 48.66 |
| 2017-18 | Blackgram | PU-31 | 15-16 | 8.70 | 5.80 | 18.25 | 10.2 | 2.9 | 45.62 |
| 2015-16 | Lentil | KL-320 | 15-18 | 14.60 | 8.60 | 69.70 | 3.4 | 6.0 | 18.88 |
| 2016-17 | Lentil | KL-320 | 15-18 | 15.55 | 11.20 | 38.84 | 2.45 | 4.35 | 13.61 |
| 2017-18 | Lentil | KLS-218 | 18-20 | 14.20 | 10.20 | 39.21 | 5.8 | 4.0 | 29.00 |
| 2016-17 | Greengram | Meha (IPM-9925) | 12-15 | 7.20 | 4.10 | 75.60 | 7.8 | 3.1 | 52.00 |
| 2017-18 | Greengram | SHWETA(K M 2241) | 10-12 | 7.30 | 5.00 | 46.00 | 4.7 | 2.3 | 39.16 |
| 2016-17 | Gram | KWR-108 | 20-23 | 22.20 | 13.60 | 63.23 | 0.8 | 8.6 | 3.47 |
| 2017-18 | Gram | KWR-108 | 20-23 | 21.25 | 12.40 | 71.37 | 1.75 | 8.85 | 7.60 |
| 2017-18 | Fieldpea | KPMR-400 | 30-32 | 20.45 | 13.20 | 54.92 | 11.55 | 7.25 | 36.09 |

**Table 3: Gross expenditure, gross return, net return and b:c ratio of pulse crops production under FLDs**

| Year | Crop | Variety | Gross Expenditure (Rs/ha) | | Gross Return (Rs/ha) | | Net Return (Rs/ha) | | B:C Ratio | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | FLD | FP | FLD | FP | FLD | FP | FLD | FP |
| 2015-16 | Blackgram | Shekhar-1 | 12800 | 11100 | 61600 | 38400 | 48800 | 27300 | 4.81 | 3.46 |
| 2017-18 | Blackgram | PU-31 | 13340 | 10000 | 35000 | 21500 | 27160 | 10220 | 2.63 | 2.15 |
| 2015-16 | Lentil | KL-320 | 16850 | 14680 | 51100 | 30100 | 34250 | 15420 | 2.03 | 1.05 |
| 2016-17 | Lentil | KL-320 | 12800 | 11100 | 69975 | 50400 | 57175 | 39300 | 4.46 | 3.54 |
| 2017-18 | Lentil | KLS-218 | 24500 | 24000 | 63900 | 45900 | 39400 | 21900 | 2.60 | 1.91 |
| 2016-17 | Greengram | Meha (IPM-9925) | 12600 | 10400 | 50400 | 28700 | 37800 | 18300 | 4.0 | 2.75 |
| 2017-18 | Greengram | SHWETA | 13340 | 11280 | 36500 | 25000 | 23160 | 13270 | 2.74 | 2.22 |
| 2016-17 | Gram | KWR-108 | 24500 | 24000 | 156800 | 92200 | 132300 | 71200 | 5.40 | 2.96 |
| 2017-18 | Gram | KWR-108 | 54500 | 48800 | 151500 | 87600 | 97000 | 39600 | 2.77 | 1.79 |
| 2017-18 | Fieldpea | KPMR 400 | 30500 | 29000 | 112250 | 66000 | 81750 | 37000 | 3.68 | 2.27 |

This emphasized the need to educate the farmers through various means for adoption of improved varieties and recommended practices. The technology index shows the feasibility of the evolved technology at the farmer's field. The lower the value of technology more is the feasibility of the technology. The technology index for gram variety KWR-108 was found lowest (3.47%), indicating the performance of this variety in Raebareli district

The data presented in Table 3 indicated that adoption of improved technology of pulses not only gave higher yield, but also provided higher benefit cost ratio as compared to the farmers practice. This may be due to higher yield obtained under the recommended practice compared to the farmers practice. Similarly result has earlier reported on pulse crops by Tomar (2010); Mokidue *et al.* (2011); Kumbhare *et al.* (2014) and Singh *et al.* (2014).

It was also observed from the data of front line demonstration recorded higher grass return and net return as compared to local check during different year in different pulse crops. The additional cost /ha in FLD yielded additional net return per hectare suggesting higher profitability and economic viability of the demonstration.

## CONCLUSION

The front line demonstration conducted on pulse crops at farmer's field, resulted that the farmers may got increased yield by following the recommended package of practice. The productivity gain under FLD over farmer's practice created awareness and motivated the other farmers to adopt scientific crops production and management. This study suggests to strengthen extension approach to educate the farmers for higher production and to increase net return on sustainable basis.

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