



# Evaluation of Productivity and Profitability of Chick pea var. JG-14 through FLD in Irrigated conditions of Kaymore Platue and Satpura Hills

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## INTRODUCTION

Chick pea (*Cicerarietinum* Linn.) is an important *rabi* season food legume having extensive geographical distribution and contributing 39 per cent to the total production of pulse in the country (Singh *et al.*, 2015). It is a good source of protein (18-22 %), carbohydrate (52-70 %), fat (4-10 %), minerals (calcium, phosphorus, iron) and vitamins. It is an excellent animal feed. Its straw also had good forage value (Singh *et al.*, 2015). The world's total production of chick pea hovers around 8.5 million metric tons annually and is grown over 10.7 million hectares of land approximately (Singh *et al.*, 2013). Its average productivity is 789 kg/ha (Singh *et al.*, 2015).

The major chick pea producing states are Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharastra, Andhra Pradesh, Gujrat, Karnatka, Haryana, Bihar and West Bengal. Abiotic stresses are responsible for declining of yield potential. Through much progress has been made in the field of agriculture research and education, but benefits of these developments could not be realized by the farming community because of low adoption of technologies at the farmers level. Front line demonstration (FLDs) was introduced by the Indian Council of Agricultural Research, New Delhi with inception of technology mission of pulse and oil seed crops during mid-eighties (Samui, 2000). The field demonstration could under the close supervision of scientist of the KVKs. Looking of above fact its yield productivity is far below the potential yield, so front line demonstration were undertaken by the Krishi Vigyan Kendra, Sidhi on the improved package of practices of chick pea in the district.

## MATERIALS AND METHODS

The present study was carried out by Krishi Vigyan Kendra (KVK), Sidhi (Madhya Pradesh) during *Rabi* seasons of 2013-14 to 2015-16 at farmers' fields of Frontline demonstration adopted villages. The area under each demonstration was 0.40 ha (1 acre). The total 10 number (4.0 ha) of demonstration was conducted in these villages. In general soil of the area under study was sandy loam with low to medium fertility status. In the demonstration one control plot was also kept where farmers' practice was carried out. The improved package of practices like use of improved and recommended varieties (JG-14), seed treatment, seed inoculation (Rhizobium and PSB), recommended dose of fertilizer (18 kg N and 46 kg P<sub>2</sub>O<sub>5</sub>/ha), use of single super phosphate (SSP) fertilizer and plant protection measures were demonstrated on the farmers' fields through frontline demonstration at different locations. Materials for the present study with respect to FLD and farmers' practices are given in Table 1.

The demonstration farmers were facilitated by KVK scientists in performing field operation likes sowing, spraying and harvesting etc. during the course of training and visits. The collected data were calculated and analyzed to draw the inference. The FLDs were conducted to study the technology gap between the potential yield and demonstrated yield, extension gap between demonstrated yield and yield under existing practice and technology index. 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, extension gap and technological index (Samui *et al.*, 2000) were calculated by using following formula as given below-

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## ARTICLE INFO

Received on : 09-08-2018  
Accepted on : 21-02-2019  
Published online : 05-03-2019

## ABSTRACT

Front line demonstrations (FLD) for improving chick pea production was conducted with high yielding chick pea variety JG-14 along coupled with scientific management practices during three seasons i.e. 2013-14 to 2015-16. Average yield of chick pea was recorded (9.80 q/ha) and (7.06 q/ha) under demonstrated plots and farmers practice respectively. However highest yield was recorded in the FLDs was (10.20 q/ha) and in case of farmers practice (7.80 q/ha). The cultivation of chick pea under improved technologies gave higher net return Rs. 20290, 21745 and 22580 per ha respectively as compared to farmers practices.

## KEYWORD

Chick pea, FLDs, Economic impact, Adoption, B:CRatio

Demonstration yield-farmers yield

Percent increase yield =  $\frac{\text{Demonstration yield} - \text{Farmers yield}}{\text{Farmers yield}} \times 100$

Technology gap = Potential yield - Demonstrated yield

Extension gap = Demonstrated yield - Yield under existing practice

Technology index =  $\frac{\text{Potential yield} - \text{Demonstrated yield}}{\text{Potential yield}} \times 100$

## RESULTS AND DISCUSSION

The gap between the existing and recommended technologies of chick pea in district Sidhiwas presented in [Table 1](#). Full gap was observed in case of use of HYVs, sowing method, seed

treatment and plant protection measure and partial gap was observed in fertilizer dose, which definitely was the reason of not achieving potential yield. Farmers were not aware about recommended technologies.

Farmers in general used old varieties and degenerated seeds instead of the recommended high yielding resistant varieties. Unavailability of seed in time and lack of awareness were the main reasons. Farmers followed broadcast method of sowing and closer spacing against the recommended line sowing, and proper spacing and because of this, they applied higher seed rate (100 kg/ha) than the recommended (75 kg/ha).

**Table 1:** Gap observed in technological intervention and farmer's practices under FLDs

Particulars	Technological intervention	Existing practices	Gap
Variety	JG -14	Radhe	Partial Gap
Land preparation	Three ploughing	Three ploughing	Nil
Seed rate	75 kg/ha	100 kg/ha	Partial Gap
Sowing Method	Line sowing	Line Sowing	No gap
Seed treatment	<i>Trichoderma</i> powder@ 5g/kg of seed	No seed treatment	Full gap
Seed Inoculation	<i>Rhizobium</i> and <i>PSB</i> powder@ 5g/kg of seed	No seed inoculants	Full gap
Fertilizer dose	18 kg N and 46 kg P2O5/ha	Only DAP is used @ 20 kg/ha	Full gap
Plant protection	Need based plant protection measure	No plant protection	Full gap

### Chick pea yield

During three years of frontier technologies results obtained are presented in [Table 2](#). The results revealed that the FLDs on Chick pea an average yield was recorded 9.80 q/ha under demonstrated plots as compare to farmers practice 7.06 q/ha. The highest yield in the FLDs plot was 10.20 q/ha and in farmers practice 7.80 q/ha. This results clearly indicated that the higher average grain yield in demonstration plots over the years compare to local check due to knowledge and adoption of full package of practices i.e. appropriate varieties such as JG-14, timely sowing, proper spacing, seed treatment with *Rhizobium* & *PSB* @ 5g/kg of seed, use

of balanced dose of fertilizer and time of sowing, timely weed management and need based plant protection measures.

The average yield of Chick pea increased 28.25 per cent. The yield of Chick pea could be increased over the yield obtained under farmers practices (use of non-descriptive local variety, no use of the balanced dose of fertilizer, untimely sowing and no control measure adopted for pest management) in chick pea cultivation. The above findings are in similarity with the findings of [Singhet al., \(2016\)](#).

**Table 2:** Yield and yield attributing character of Gram under FLDs

Year	Variety	Trial No.	Area (ha)	Potential yield (q/ha)	Average yield (q/ha)		Percent yield increase	No. of Pods/plant	
					Trial	Farmers practice		Trial	Farmer's Practice
2013 -14	JG -14	10	4.0	20	9.38	6.26	33.26	81.24	54.26
2014 -15	JG -14	10	4.0	20	9.83	7.12	27.60	82.31	51.81
2015 -16	JG -14	10	4.0	20	10.20	7.80	23.90	83.80	50.60
Total/Average	-	30	12	-	9.80	7.06	28.25	82.45	52.22

### Technology Gap

The technology gap, i.e. the differences between potential yield and yield of demonstration plots were 10.62, 10.17 and 9.80 q/ha during 2013-14, 2014-15 and 2015-16 respectively. On an average technology gap during three years FLDs programme was 10.19 q/ha ([Table 3](#)). The technology gap observed may be attributed to dissimilarity in the soil fertility status, agricultural practices and local climatic situation.

### Extension Gap

Extension gap of 3.12, 2.71 and 2.40 q/ha was observed during 2013-14, 2014-15 and 2015-16 respectively ([Table 3](#)). On an average extension gap was observed 2.74q/ha which emphasized the need to educate the farmers through various extension means i.e. front line demonstration for adoption of improved production and protection technologies, to revert the trend of wide extension gap. More and more use of latest

production technologies with high yielding varieties will subsequently change this alarming trend of galloping extension gap.

**Technology Index**

The technology index shows the feasibility of the demonstrated technology at the farmer's field. The technology index varied from 49.00 to 53.10 per cent (Table 3).

On an average technology index was observed 50.98 per cent during the years of FLDs programme, which shows the efficacy of good performance of technical interventions. This will accelerate the adoption of demonstrated technical intervention to increase the yield performance of lentil. This finding is in corroboration with the findings of Singh *et al.* (2016).

**Table 3:** Technology & Extension gap and Technological Index observed under FLDs

Year	Variety	Trial No.	Area (ha)	Technology gap (q/ha)	Extension gap (q/ha)	Technological index (%)
2013 -14	JG -14	10	4.0	10.62	3.12	53.10
2014 -15	JG -14	10	4.0	10.17	2.71	50.85
2015 -16	JG -14	10	4.0	9.80	2.40	49.00
Total/Average	-	30	12.0	10.19	2.74	50.98

**Economic return**

The inputs and outputs prices of commodities prevailed during the study of demonstrations were taken for calculating net return and benefit: cost ratio (Table 4). The cultivation of Chick pea under improved technologies gave higher net return Rs. 20290, 21745 and 22580 per ha in 2013-14, 2014-15 and 2015-16 respectively as compared to farmers practices.

Similar findings were reported by Singh *et al.*, (2016). The benefit: cost ratio of Chick pea cultivation under improved cultivation practices were 2.62, 2.72 and 2.72 as compared to 2.09, 2.35 and 2.42 under farmer's practice. This may be due to higher yield obtained under improved technologies compared to farmer's practice. This finding is in corroboration with the findings of Mokidue *et al.*, (2011).

**Table 4:** Economical observations of Gram under FLDs

Year	Variety	Trial No.	Area (ha)	Gross Income (Rs./ha)		Net Return (Rs./ha)		B:C Ratio	
				Trial	Farmers practice	Trial	Farmer's Practice	Trial	Farmer's Practice
2013-14	JG-14	10	4.0	32830	21910	20290	11430	2.62	2.09
2014-15	JG-14	10	4.0	34405	24920	21745	14360	2.72	2.35
2015-16	JG-14	10	4.0	35700	27300	22580	16060	2.72	2.42

**CONCLUSION**

The FLD produces a significant positive result and provided the researcher an opportunity to demonstrate the productivity potential and profitability of the latest technology (Intervention) under real farming situation. In spite of increase in yield of chick pea, technology gap,

extension gap and technology index existed. The variation in per cent increase in the yield was found due to the lack of knowledge, and poor socio economic condition. It is concluded that the FLDs programmes were effective in changing attitude, skill and knowledge of improved package and practices of HYV of chick pea adoption.

**REFERENCES**

Mokidue I, Mohanti AK and Kumar S. 2011. Correlating growth, yield and adoption of urdbean technologies. *Indian J. Ext. Edu.* 11(2):20-24

Samui SK, Mitra S, Roy DK, Mandal AK and Saha D. 2000. Evaluation of front line demonstration on groundnut. *Journal of the Indian Society Coastal Agricultural Research* 18(2):180-183.

Singh AK, Manibhushan, Bhatt BP, Singh KM and Upadhyaya A. 2013. An Analysis of oilseeds and pulses scenario in eastern India during 2050-51. *Journal of Agril. Sci.* 5 (1) 241- 249.

Singh AK, Singh SS, Prakash V, Kumar S and Dwivedi SK. 2015. Pulses production in India: Present status, bottleneck and way forward. *Journal of AgriSearch* 2 (2): 75-83.

Singh D, Patel AK, Singh SK and Baghel MS. 2016. Increasing the Productivity and Profitability of Paddy through Front Line Demonstrations in Irrigated Agro Ecosystem of Kaymore Platue and Satpura Hills. *Journal of AgriSearch* 3(3): 161-164.

**Citation:**

Singh D, Singh A, Singh R and Baghel MS. 2019. Evaluation of productivity and profitability of chick pea var. JG-14 through FLD in irrigated conditions of Kaymore Platue and Satpura Hills. *Journal of AgriSearch* 6(1): 26-28