



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2018; 6(4): 878-880

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Received: 20-05-2018

Accepted: 23-06-2018

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Impact of front line demonstration of field pea in bundhekhand region of Madhya Pradesh

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Abstract

Front line demonstration on field pea was conducted by Krishi Vigyan Kendra Panna district during the period from 2013-14 and 2014-15 in seven villages of two blocks with 87 numbers of farmers. FLD on Prakash variety of the Field pea with full package of practice was conducted in a 28 ha during the two year with recommended improved practices. A control plot was also kept where farmers practices was carried out.

In comparison to the year 2013-14, yield during the year 2014-15 was higher both in the demonstration plot (1928 kg/ha) and farmers plot (1530kg/ha). During both the years the mean yield in the demonstration plots were higher than the farmers plot by 24 and 26 percent respectively during 2013-14 and 2014-15. The mean yield of the demonstration was 1871 kg/ha against the potential yield of 2200kg/ha of Prakash variety of the Field pea. The yield gap of 329 kg/ha indicates that there exists a technology gap. Interestingly the extension yield gap ranging between 350-398 kg/ha during the period of study was higher than the Technological yield gap.

The technology index shows the feasibility of the evolved technology at the farmer's fields and the lower technology index more is the feasibility of the technology index varied from 12.36 to 17.5 percent. Cultivation of field pea under improved technologies gave average higher net return of Rs. 35,868/ha as compared to Rs 27,230/ha under local farmers practices. The benefit cost ratio of field pea under improved technologies was higher (2.61) than that (2.41) under farmers practices.

Keywords: Yield gap, technology gap technology index and B.C. ratio

Introduction

Field Pea (*Pisum sativum* L) is a popular pulse crop in India. India is the largest producer, consumer and importer of pulses. Garden pea and field pea are cultivated in India. Garden pea is harvested as green pods and cooked as fresh or canned for subsequence uses. Field pea is generally grown for dry seeds which are used for a variety of culinary and pulse. According to Reddy 2010 dry pea is highly nutritive containing high proportion of digestive protein (22.5 %) carbohydrates (62.1%) fat (1.8%) minerals (calcium, Iron) and Vitamins (Riboflavin, Thiamine). The most probable centre of origin of pea is Mediterranean region of Europe and Central Asia.

India is the second largest producer of pea in the world after Russia. Field pea is cultivated on 6.51 million ha area with the total production of 10.95 million tons. Field pea is distributed in Asia, Africa, Europe, North America, Australia, China, Russian, Ukraine, India Ethiopia, France Canada and USA. In India the average productivity of field pea is 906 kg/ha. The major field pea growing states are Uttar Pradesh Madhya Pradesh, Bihar and Maharashtra. In Madhya Pradesh it is cultivated in 3.48 lakh ha area with 2.80 lakh tonnes production.

Field pea in Panna district occupies 11680 ha with an average productivity of 1666 kg/ha of Field pea Crop. It is in Bundhelkhand region and in Kymore plateau and Satpura hills agro-climatic zone. It is having very typical land topography, soil type and physio-chemical properties. Front line demonstration Field pea was conducted by the Indian Council of Agricultural Research, New Delhi under Technology mission of pulse and oilseed crops during mid eighties. Field demonstration conducted under the close supervision of scientist of the Krishi Vigyan Kendra.

Material and Methods

Field pea is an important cash crop for farmers Panna, but the profitability remains low. An intensive Rapid Rural appraisal and several round of group meetings of field pea growers were

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organized to explore the reasons for its low productivity. Several gaps in the technological adoption emerged as outcome of the meetings. The production constraints were subjected to matrix ranking with the help of farmers.

On the basis of matrix ranking and prioritization of the problems Front line demonstration on field pea was proposed in the annual action plan of Krishi Vigyan Kendra Panna district during the year 2013-14 in seven villages of the two blocks- Panna and Ajaygarh. The FLD programme with full package of practice covered 87 field pea growers during the year 2013-14 and 2014-15. Individual demonstration area varied from 0.4 to 0.8 ha while the total area was 28 ha. Most of the participating farmers kept a control plot from comparison.

The cropping period was split into different growth period. All the farmers were imparted field training on the particular operation of the field pea cultivation. Such an approach was very encouraging and participation was cent percent.

The Technology demonstrated was improved field pea variety –Prakash sown in line with row spacing of 30cm at a seed rate 100kg/ha, after seed treatment with Carboxin + Thiram @2g/kg seed along with bio-fertilizer Rhizobium+PSB each

@10g/kg seed. basal Fertilizers applied as a basal dose at the rate of 20N:50P:20K kg/ha through Urea, Single super phosphate and MOP respectively. Application of pesticides for management of insect pests and diseases were as and when required.

The primary data was collected from the selected FLD Farmers by random crop cutting method while personal interview schedule for technology performance and acceptance. The qualitative data was converted into quantitative form and expressed in term of percent increased yield extension gap and technology index following Samui *et al.* (2000) [6].

$$\% \text{ increased yield} = \frac{\text{Demonstration yield} \times 100}{\text{Farmer's yield}}$$

Technology gap = Potential yield – demonstration yield

Extension gap = Demonstration yield – farmer's yield

$$\text{Technology index (\%)} = \frac{\text{Technology gap} \times 100}{\text{Potential yield}}$$

Table 1: Performance of the FLD during 2013-14 and 2014-15

| Year | Crop (variety) | No of FLD | Area (ha) | Yield (kg/ha) | | | % increased yield over local check | Technology gap (kg/ha) | Extension gap (ka/ha) | Technology index (%) |
|---------|---------------------|-----------|-----------|----------------------|-----------|-------------------|------------------------------------|------------------------|-----------------------|----------------------|
| | | | | potential of variety | FLD yield | Farmers Practices | | | | |
| 2013-14 | Field Pea (Prakash) | 44 | 17.60 | 2200 | 1815 | 1465 | 24 | 385 | 350 | 17.5 |
| 2014-15 | Field Pea (Prakash) | 25 | 10.00 | 2200 | 1928 | 1530 | 26 | 272 | 398 | 12.36 |
| | Average | 63 | 27.60 | 2200 | 1871 | 1497 | 25 | 329 | 374 | 15 |

Result and Discussion

The two year data presented in the table 1. In comparison to the year 2013-14, yield during the year 2014-15 was higher both in the demonstration plot (1928 kg/ha) and farmers plot (1530kg/ha). However in during both the years the mean yield in the demonstration plots were higher than the farmers plot by 24 and 26 percent respectively during 2013-14 and 2014-15. The data indicates that with the recommended field pea production technology the yield can be increased. Diwedi *et al.* (2010) [2] also observed that technology adoption is the key to increase crop productivity. The mean yield of the two year demonstration was 1871 kg/ha than that of farmers practices (1497 kg/ha).

Technology Gap

The mean yield of the demonstration was 1871 kg/ha against the potential yield of 2200kg/ha of Prakash variety of the Field pea. The yield gap of 329 kg/ha indicates that there exists a technology gap. Prakash variety of field pea is developed for fertile and irrigated regions of north India while the demonstrations were conducted in Bundelkhand agro-climatic region. Therefore such a yield gap should not surprise the development managers. However there should be an effort to further narrow the present technology gap. This can be done if On farm trials are carried with different soil types in Panna district with assured irrigation. Technological yield gap of crops due to variation in the soil fertility and weather conditions is reported by Raj, *et.al* (2013).

Extension Gap

Interestingly the extension yield gap ranging between 350-398 kg/ha during the period of study was higher than the

Technological yield gap. This throw light that the field agricultural extension workers needs to be technologically upgraded in their knowledge on Field pea production technology either through skilled based field training or short In-service training and visit to Research stations. The field agricultural extension workers also need to be trained on skills of transfer of technology for effective translation of knowledge into potential yield of the crop. Another approach may also to be engage farmers on regular basis in Krishi Vigyan Kendra on production of field pea, as this crop is very important to the poverty stricken Bundelkhand farmers. Singh *et al.* (2017) [7] in their study on extension gap also agrees with the present observation.

Technology Index

The technology index shows the feasibility of the evolved technology at the farmers fields and the lower technology index more is the feasibility of the technology index varied from 12.36 to 17.5 percent indicates that a minor gap existed between technology evolved and technology adoption at farmers field similar result was found by Raj *et.al* (2013). It is evident from the results that application of different inputs viz. improved variety good seed and seed treatment with fungicides and bio fertilizers leads to significant increase in growth and yield of field pea under semi irrigated condition.

Economic Return

The inputs and outputs prices of commodities prevailed during the study of demonstrations was taken for calculating cost of cultivation, gross return, net return and benefit cost ratio (table -2). Cultivation of field pea under improved technologies gave average higher net return of Rs. 35,868/ha

as compared to Rs 27,230/ha under local farmers practices. The benefit cost ratio of field pea under improved technologies was higher (2.61) than that (2.41) under farmers

practices. This finding is in corroboration with the findings by Mokidue *et al.* (2011) [3].

Table 2: Economics of FLD and farmers practices

| Year | Cost of cultivation (Rs./ha) | | Gross return (Rs./ha) | | Net Return (Rs/ha) | | B:C Ratio | |
|---------|------------------------------|-----------|-----------------------|-----------|--------------------|-----------|-------------------|-----------|
| | Farmers practices | under FLD | Farmers practice | Under FLD | Farmers practices | Under FLD | farmers practices | under FLD |
| 2013-14 | 18350 | 21140 | 43950 | 54450 | 25600 | 33310 | 2.40 | 2.60 |
| 2014-15 | 20100 | 23270 | 48960 | 61690 | 28860 | 38426 | 2.43 | 2.65 |
| Average | 19225 | 22205 | 46455 | 58070 | 27230 | 35868 | 2.41 | 2.61 |

Table 3: Impact of FLD field pea crop in Panna district

| Parameters | Impact of FLD | | Increase In % |
|--|-------------------|--------------------|--------------------------|
| | Before(2013-14) | After(2015-16) | |
| Area of field pea (ha) | 9765 | 11680 | 19.61 |
| Average productivity of Field pea(kg/ha) | 1265 | 1666 | 31.69 |
| Total revenue generate by selling @ Rs3500 /q field pea | Rs43.23 crores | Rs68.10 crores | 57.52 (Rs24.87crores) |
| Employment generated by increase field pea area @55 man-days/ha) | 5,37,075 man-days | 64,24,009 man-days | 19.61 (1,05,325 mandays) |

The result reveals that the dissemination of technologies increased the horizontal spread of area (19.61%), productivity (31.69%), total revenue generated Rs. 24.87 crores and 19.61 percent more rural employment generated through field pea cultivation.

Acknowledgements

The author is thankful to ICAR ATARI ZONE IX Jabalpur and Jawaharlal Nehru Krishi Vishwa Vidyalaya (M.P.) for financial assistance.

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