Original Research Article

Impact of Cluster Frontline Demonstrations (CFLDs) on kharif Groundnut Productivity and Income of Farmers in Jamnagar District of Gujarat

S. H. Lakhani*, K. P. Baraiya and A. K. Baraiya

Krishi Vigyan Kendra, JAU, Jamnagar, India

*Corresponding author

A B S T R A C T

The cluster frontline demonstrations (CFLDs) on groundnut were conducted by Krishi Vigyan Kendra, Junagadh Agricultural University, Jamnagar (Gujarat) during kharif season from 2016-17 to 2018-19 on 150 farmer’s field of different villages of Jamnagar district. The results revealed that the average higher pod (21.1 q/ha) and haulm (40.21 q/ha) yield of groundnut were recorded in CFLDs as compared to farmer’s practices (FP) average pod (17.5 q/ha) and haulm (37.85 q/ha) yield. The increase in the demonstrations pod yield over FP was 20.35 %. The extension gap, technology gap and technology index were 3.6 q/ha, 6.16 q/ha and 22.60 % respectively. The average gross return (Rs. 110879/ha) and net return (Rs. 66207/ha) in CFLDs were found higher than the FP gross return (Rs. 93844/ha) and net return (Rs. 43334/ha). The average net returns 52.21% higher than that of FP. The B: C ratio exhibited the same trend as in gross and net return which was found 2.49 in CFLDs and 1.86 in FP. By conducting cluster frontline demonstrations of improved variety with intervention practices of proven technologies in farmer’s field, groundnut productivity enhanced to a great extent which increased in the income level of farmers and improved livelihood of farming community.

Introduction

Groundnut (Arachis hypogaea L.), is a leguminous crop plant which is widely cultivated in the tropics and subtropics between 40°N and 40°S latitudes. It is valued for its high-oil edible seeds and as such it is the fourth most important source of edible oil and third most important source of vegetable protein in the world. Groundnut is not only an important oilseed crop of India but also an important agricultural export commodity. With annual all-season coverage of about 70 lakh hectares, globally India ranks first in groundnut acreage and with an output of approx. 80-85 lakh MT (in shell groundnuts), second in production. Although in various states of India groundnut is cultivated in one or more (kharif, rabi and summer) seasons, nearly 80% of acreage and production comes from kharif crop (June-October). The area under groundnut in Gujarat is 14.68 lakh hectares with a production of 20.85 lakh MT and 1421 kg/ha productivity during kharif 2018-19 (Anon., 2019).
Groundnut is an important oilseed crop of Jamnagar district of Gujarat which is cultivated in *kharif* season cover an area of 1.3 lakh hectares with production 2.14lakh MT and 1641 kg/ha productivity during *kharif* 2018-19 (Anon., 2019). The district has been considered as productively potential region of groundnut due to assured irrigation facilities, precise irrigation management through sprinkler and favourable soil and climate conditions. However, there is a wide gap between the potential and the actual production realized by the farmers due to partial adoption of recommended package of practices by the growers. Technology gap i.e. poor knowledge about newly released crop production and protection technologies and their management practices in the farmers’ fields is a major constraint in groundnut production. So far, no systematic approach was implemented to study the technological gap existing in various components of groundnut cultivation.

Awareness of scientific production technology *viz.*, new variety, seed treatment with fungicide, insecticide and biofertilizers, soil test based nutrient management is lacking in district which was a key reason for low productivity of groundnut. The productivity of crop could be increased by adopting recommended scientific and sustainable management production practices with improved high yielding varieties and other critical input through cluster frontline demonstrations (CFLDs). Conducting cluster front line demonstrations on farmer’s field help to identify the constraints and potential of the groundnut in specific area as well as it helps in improving the economic and social status of the farmers. The aim of the cluster front line demonstrations is to convey the technical message to farmers that if they use recommended package and practices then the yield of this crop can be easily doubled than their present level.

Keeping the above point in view, CFLDs on groundnut using improved production technologies was conducted under National Mission on Oilseeds and Oil palm (NMOOP) scheme with the objectives of showing the productive potentials and profitability of the integrated production technologies under real farm situation over the locally cultivated groundnut crop.

**Materials and Methods**

The present study was carried out in operational area by Krishi Vigyan Kendra, Junagadh Agricultural University, Jamnagar (Gujarat) during *kharif* season from 2016-17 to 2018-19 (3 years) in farmer’s field of different villages of Jamnagar district of Gujarat under National Mission on Oilseeds and Oil palm (NMOOP) scheme. In total 150 cluster frontline demonstrations (CFLDs) conducted in 60 ha area covering different villages. Each farmers plot size was 0.4 ha (1.0 acre) under CFLDs for demonstration of recommended improve production practices of groundnut. The rainfall recorded in the demonstration area during 20016-17 was 435 mm, in 2017-18 was 697 mm and in 2018-19 was 370 mm.

In the demonstration plots, few technical inputs of CFLDs were given to farmer per acre basis on one month before a season in group meeting programme and trained each farmers for their appropriate application in field. The technological inputs were improved variety GJG-22 seed, Bio fertilizers (*Rhizobium* and Phosphate solubilizing microorganisms), *Tricoderma harzianum*, *Beauveria bassiana* and *Metarhizium anisopliae* provided to farmers. The soil samples were taken and analyses before sowing of CFLDs. Other technological information like sowing time, seed treatment, soil test based nutrient management, weed and water management, IPM practices,
harvesting and threshing also given time to
time. KVK scientist also visited
regularly to
the demonstrations fields and continuously
guides the farmers. Field days and group
meeting were also organised at demonstration
sites to provide the opportunities for other
farmers to witness the benefits of
demonstrated technologies. The necessary
steps for the selection of site, farmers and lay
out of demonstration were followed as
suggested by Chaudhary (1999).

In the demonstration, one control plot was
also kept where farmer’s practices was carried
out. Data were collected with the help of
personal contact and observations on yield
data was also recorded at the time of separate
threshing. The yield of each demonstration
was recorded in a systematic manner and the
yield of farmer’s practices was also recorded
at the same time. The data obtained from
demonstration plot and famers plot were
analyzed for extension gap, technological gap
and technological index study (Samui et al.,
2000) as given below.

Extension gap = Demonstration yield-
Farmer’s yield

Technology gap = Potential yield-
Demonstration yield

\[
\text{Technology index} = \frac{(\text{Potential yield} - \text{Demonstration yield}) \times 100}{\text{Potential yield}}
\]

The data collected were tabulated and
statistically analyzed to interpret the results.
The economic parameters (gross return, net
return and B: C ratio) were worked out on the
basis of prevailing market prices of input and
Minimum Support Prices of output.

Results and Discussion

Groundnut yield

Results of 150 cluster frontline
demonstrations conducted during 2016-17 to
2018-19 in 60 ha area on farmer’s field
revealed that the average higher pod (21.1
q/ha) and haulm (40.21 q/ha) yield of
groundnut were recorded in CFLDs as
compared to farmer’s practices average pod
(17.5 q/ha) and haulm (37.85 q/ha) yield. The
results clearly indicated that the pod yield of
groundnut could be increased by 20.35 %
over the pod yield obtained under farmer’s
practices of groundnut cultivation due to
adoption of improved variety GJG-22 with
appropriate production technology. Similar
results were also observed by Dubey et al.,
(2011), Jat and Katiyar (2015), Paware et al.,
(2017) and Undhad et al., (2019).

Extension gap and technology gap

The data presented in Table-1 indicated that
the extension gap ranged from 2.3 q/ha to 5
q/ha and overall average extension gap was
3.6 q/ha during the period of demonstration
emphasized the need to educate the farmers
through various means for the adoption of
improved groundnut production technologies
to reverse this trend of wide extension gap.
More and more use of latest production
technologies with high yielding varieties will
subsequently change this alarming trends
galloping extension gap. The new
technologies will eventually lead to the
farmers to discontinuance of old varieties
with new technology.

However, the technology gap observed
ranged from 4.26 q/ha to 9.46 q/ha. The
average 6.16 q/ha technology gap observed
during the experimental period. The
technology gap observed may be attributed to
the dissimilarity in the soil fertility status and
weather conditions i.e. rainfall and
temperature. Hence variety wise location
specific recommendation appears to be
necessary to minimize the technology gap for
yield level of different situations.
Technology index

In case of technology index, lower the value of technology index indicate more is the feasibility of technology. The data (Table 1) showed that minimum technology index value 15.63 % was noticed in 2017-18 followed by 17.46 % in 2016-17 whereas, maximum value of technology index 34.70 % in 2018-19, it may be due to uneven and lower rainfall (370 mm) during kharif season in 2018-19. The average 22.60 % technology index found during the experimental period it exhibited the feasibility of technology demonstrated. The finding of the present study is in line with the finding of Jat and Katiyar (2015) and Pawar et al., (2017).

Table 1 Productivity, extension gaps, technology gaps and technology index of kharif groundnut as grown under cluster frontline demonstrations (CFLDs) and existing farmer’s practices (FP)

<table>
<thead>
<tr>
<th>Year</th>
<th>Area (ha)</th>
<th>No of Demo</th>
<th>Potential pod Yield (q/ha)</th>
<th>Average pod yield (q/ha)</th>
<th>Average Haulm yield (q/ha)</th>
<th>% pod yield increase over FP</th>
<th>Extension gap (q/ha)</th>
<th>Technology gap (q/ha)</th>
<th>Technology index (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Demo.</td>
<td>FP</td>
<td>Demo.</td>
<td>FP</td>
<td>Demo.</td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016-17</td>
<td>20</td>
<td>50</td>
<td>27.26</td>
<td>22.5</td>
<td>41.40</td>
<td>39.55</td>
<td>18.42</td>
<td>3.5</td>
<td>17.46</td>
</tr>
<tr>
<td>2017-18</td>
<td>20</td>
<td>50</td>
<td>27.26</td>
<td>23</td>
<td>44.32</td>
<td>42.50</td>
<td>27.78</td>
<td>5</td>
<td>15.63</td>
</tr>
<tr>
<td>2018-19</td>
<td>20</td>
<td>50</td>
<td>27.26</td>
<td>17.8</td>
<td>34.90</td>
<td>31.50</td>
<td>14.84</td>
<td>2.3</td>
<td>34.70</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td>27.26</td>
<td>21.1</td>
<td>40.21</td>
<td>37.85</td>
<td>20.35</td>
<td>3.6</td>
<td>22.60</td>
</tr>
</tbody>
</table>

Table 2 Economic analysis of cluster frontline demonstrations and farmer’s practices

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost of cultivation (Rs./ha)</th>
<th>Gross return (Rs./ha)</th>
<th>Net return (Rs./ha)</th>
<th>B:C ratio</th>
<th>Net return increase over FP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Demo.</td>
<td>FP</td>
<td>Demo.</td>
<td>FP</td>
<td>Demo.</td>
</tr>
<tr>
<td>2016-17</td>
<td>45000</td>
<td>53500</td>
<td>111510</td>
<td>96000</td>
<td>66510</td>
</tr>
<tr>
<td>2017-18</td>
<td>43736</td>
<td>50400</td>
<td>120124</td>
<td>97136</td>
<td>76388</td>
</tr>
<tr>
<td>2018-19</td>
<td>45280</td>
<td>47630</td>
<td>101002</td>
<td>88395</td>
<td>55722</td>
</tr>
<tr>
<td>Mean</td>
<td>44672</td>
<td>50510</td>
<td>110879</td>
<td>93844</td>
<td>66207</td>
</tr>
</tbody>
</table>

Economics

The economics of groundnut production under cluster frontline demonstrations and farmer’s practices have been presented in Table 2. The average gross return (Rs. 110879/ha) and net return (Rs. 93844/ha) in CFLDs were found higher than the farmer’s practices gross return (Rs. 93844/ha) and net return (Rs. 43334/ha). The average net returns 52.21 % higher than that of farmer’s practice. The B: C ratio exhibited the same trend as in gross and net return which was found 2.49 in CFLDs and 1.86 in farmer’s practice. It showed that the adoption of demonstration technology by farmers would be higher economically and gainful proposition. Similar results were also reported by Jat and Katiyar.
From the above findings, it can be concluded that by conducting cluster frontline demonstrations of improved variety with intervention practices of proven technologies in farmer’s field, groundnut productivity enhanced to a great extent which increased in the income level of farmers and improved livelihood of farming community. Farmers were motivated by cluster frontline demonstrations in groundnut crop and they would adopt these technology in the coming years.

References


How to cite this article:


doi: [https://doi.org/10.20546/ijemas.2020.911.129](https://doi.org/10.20546/ijemas.2020.911.129)