

Original Research Article

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## Technological Gap among Small and Marginal Farmers in Adoption of Improved Cultivation Practices of Chickpea Crop

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### ABSTRACT

The study conducted in twelve villages Viz., Askihal, Yaklasapur, Amaravathi, Kuppigudda, Melakunda, Srinivas saradagi, Kollur, Maradagi, Narayanapura, Betabalakunda, Siddeshwara and Bhalki of Hyderabad–Karnataka region of Karnataka, during the year 2014- 15, to know the technological gap among the small and marginal farmers in adoption of improved cultivation practices chickpea crop. The study revealed that, majority of the small farmers (83.33 %) and marginal farmers (43.33 %) of chickpea crop belonged to medium technological gap category. Meager per cent of the technological gap was observed among the small and marginal farmers of chickpea in the practices like soil type, land preparation, sowing season, varieties, seed rate, spacing and hand weeding and huge technological gap was observed in application of FYM, intercultivation, use of herbicides, growth regulator and nipping. With regard to integrated pest management, cent per cent of both small and marginal farmers did not follow the practices like mechanical beating of plants, erection of bird perches and pheromone traps.

#### Keywords

Technological gap, Chickpea, Improved cultivation practices, Small and marginal farmers

#### Article Info

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### Introduction

Chickpea (*Cicer arietinum*) is the rich source of protein. The seed contains 21.10 per cent proteins, 61.50 per cent carbohydrates and 4.50 per cent fats. Besides, it contains iron, calcium & Niacin in sufficient quantity. It has been proved very good fodder for milking animals. The tender leaves are used as vegetable. The floor is used in preparing

different products. The malic acid and oxalic acid present in chickpea plant is used in medicine preparation.

Among pulses, chickpea is the most important pulse crop grown in India in 6.93 million hectare area which contributes 62 per cent of the global production (5.6 million tonnes) and about 37 per cent of total pulse production in the country.

Chickpea is the largest produced food legume in South Asia and the third largest produced food legume globally. Chickpea is grown in more than 50 countries. Asia accounts 89.70 per cent of the area in chickpea production, followed by 4.3 per cent in Africa, 2.60 per cent in Oceania, 2.9 per cent in Americas and 0.4% in Europe. India ranked first in terms of chickpea production and consumption in the world. About 65 per cent of global area with 68 per cent of global production of chickpea is contributed by India (Amarender and Devrajmishra, 2010). India grows chickpea on about 6.86 m ha producing 5.35 m tones of grains, which represents 32 per cent and 42 per cent of the national pulse acreage and production, respectively. The major chickpea producing states viz., Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh, Karnataka and Andhra Pradesh together contribute 91.00 per cent of the production and 90.00 per cent of the area under chickpea.

In Karnataka, chickpea is grown in an area of 80, 02,570 hectares with production of 3, 94,904 tones, having an average productivity of 518 kgs per ha. It is largely grown in the northern parts of the state like Kalaburgi with an area about 1,66,956 hectares, has the highest area under chickpea with production of 1,17,846 tonnes and a productivity of 743 kg/hectare, followed by Bijapur with an area of 1,19,299 hectares, with production of 49,527 tonnes with a productivity of 437 kg per hectares stands second, while Raichur with an area 69,776 hacter, with production of 30,956 tonnes with a productivity of 467 kg per hectares stands third (Anonymous-2011-12).

**Materials and Methods**

The study was undertaken in twelve villages Viz., Askihal, Yaklasapur, Amaravathi, Kuppigudda, Melakunda, Srinivas saradagi, Kollur, Maradagi, Narayanapura, Betabalakunda, Siddeshwara and Bhalki of

Hyderabad–Karnataka region of Karnataka, during the year 2014-15, to know the technological gap among the small and marginal farmers in adoption of improved cultivation practices chickpea crop. Based on the random sampling techniques 60 small farmers and 60 marginal farmers at the rate of 5 small and 5 marginal farmers from each village were selected. Thus the total sample comprises for the study were 120.

The data of the respondents were collected by using pretested schedule and analyzed with suitable statistical tools.

The technological gap of a particular practice was calculated by using following formula

Technological gap =

$$\frac{\text{Maximum possible Score} - \text{Actual score obtained}}{\text{Maximum possible score}} \times 100$$

The mean technological gap in chickpea cultivation practices was taken as the dependent variable. The respondents were then divided into three categories viz., Low, Medium and High based on their mean technological gap.

Sl. No.	Category	Range
1	Low	Less than (Mean - 0.425 SD)
2	Medium	Between (Mean ± 0.425 SD)
3	High	More than (Mean + 0.425 SD)

**Results and Discussion**

**Overall technological gap regarding improved cultivation practices chickpea among small and marginal farmers**

It is clear from the Table 1 and Figure 1 that, Majority (83.33 %) of the small farmers of chickpea crop belonged to medium

technological gap category, followed by low (13.33 %) and high (3.33 %) technological gap categories. Further, 43.33 per cent of the marginal farmers of chickpea crop belonged to medium technological gap category, followed by high (38.33 %) and medium (18.33 %) technological gap categories in chickpea crop.

As per the Mann Whitney-U test analysis, there was a significant difference existed among the small and marginal farmer categories in technological gap of improved cultivation practices of chickpea.

**Technological gap with respect to individual improved cultivation practices of chickpea among small and marginal farmers**

From the results it was observed that, meagre per cent of the technological gap was observed among the small and marginal farmers of chickpea in the practices like soil type, land preparation, sowing season, varieties, seed rate, spacing and hand weeding. Farmers were well versed with these practices and they did not incur many expenses, these practices are easy to carry out.

By practicing these practices in desired way one could get good yield and economic returns. These might the reasons for above findings.

Huge technological gap was observed in application of FYM (75 and 78.33 %). This may be due to lack of availability of sufficient quantity of FYM due to medium level of livestock possession. 88.33 and 93.33 per cent of gap was observed among the small and marginal farmers respectively in intercultural operation. This may be due to the fact that, chickpea is a rabi crop, weed intensity is less due to low rain fall during crop period.

More technological gap was observed in use of herbicides, growth regulator and nipping. This may be due to lack of knowledge about these practices and nipping practice is laborious, time consuming and expensive.

Less technological gap was observed in use of chemicals for management pod borer. This may be due to, infestation of pod borer leads severally impact on yield. As a result majority of the farmers adopted the recommended plant protection measures to control the pod borer.

**Table.1** Overall technological gap about chickpea improved cultivation practices among small and marginal farmers

n=120

Sl.No.	Catagories	Small farmers (n <sub>1</sub> = 60)		Marginal farmers (n <sub>2</sub> = 60)		Pooled data	
		F	%	F	%	F	%
1	Low (Mean - 0.425*SD)	8	13.33	11	18.33	19	15.83
2	Medium (Mean ±0 .425*SD)	50	83.33	26	43.33	76	63.33
3	High (Mean + 0 .425*SD)	2	3.33	23	38.33	25	20.83
	<b>Mean</b>	32.01		39.46		35.71	
	<b>SD</b>	5.82		7.21		7.52	
	<b>Mann Whitney-U test</b>	SF Vs MF- .000**					
		** = Significant at 1 % level					

**Table.2** Technological gap with respect to improved cultivation practices of chickpea among small and marginal farmers

n=120

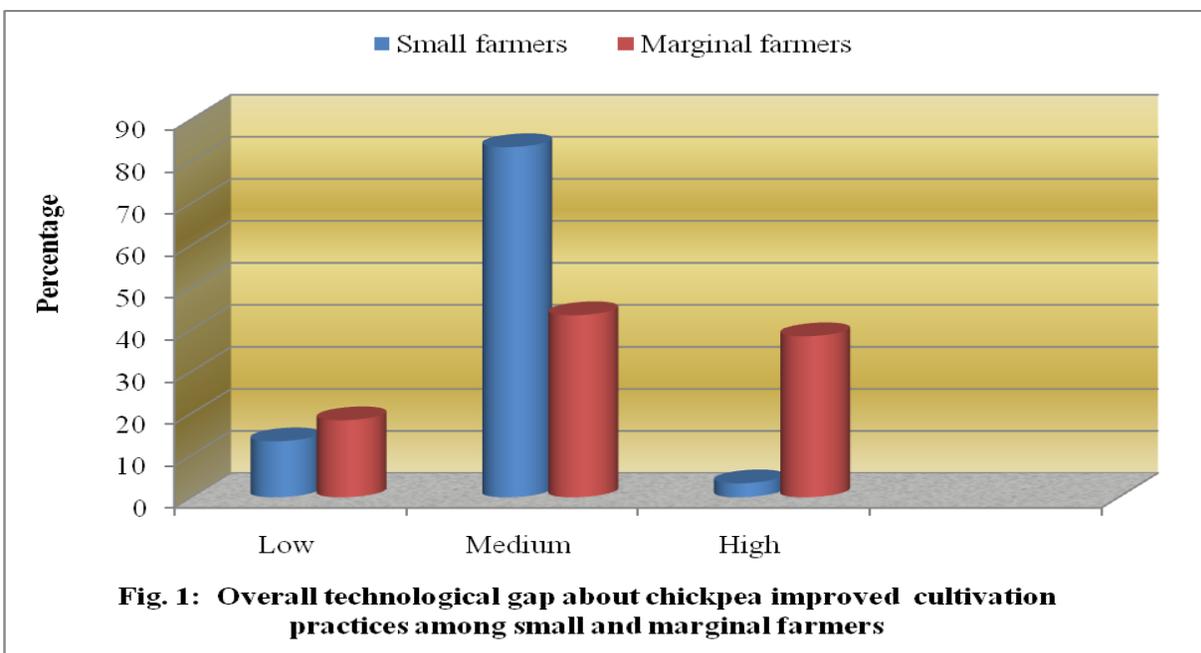
Sl. No.	Practices	Technological gap (in %)	
		Small farmers (n <sub>1</sub> = 60)	Marginal farmers (n <sub>2</sub> = 60)
1	Soil type	20.00	35.00
2	Land preparation	11.67	25.00
3	FYM application	75.00	78.33
4	Sowing season	18.33	28.33
5	Varieties	10.00	15.00
6	Seed rate	35.00	28.33
7	Seed treatment	85.00	93.34
8	Seed cum fertilizer drill	0.00	0.00
9	Spacing	8.33	16.67
10	Intercropping	100.00	100.00
11	Thinning	100.00	100.00
12	Intercultivation	88.33	93.33
13	Spraying of Urea	100.00	100.00
14	<b>Weed management</b>		
	Hand weeding	25.00	45.00
	Herbicides	85.00	88.34
15	Nipping	70.00	86.67
16	Growth regulator	90.00	91.67
17	<b>Fertilizer application</b>		
	N	35.00	51.67
	P	40.00	71.67
18	<b>Plant Protection measures</b>		
	Pod borer	21.67	30.00
	Wilt	100.00	100.00
	Sterility mosaic	100.00	100.00
19	Neem seed kernel extract/ Neem oil	100.00	100.00
20	Use of chilly and garlic solution	100.00	100.00
21	<b>Integrated Pest Management</b>		
a	Deep summer ploughing	11.67	25.00
b	Chickpea+ 200gm pundi/jawar	0.00	0.00
b	I Spray (20-30 DAS)	75.00	71.67
c	II Spray-At the stage of 50% flowering	25.00	33.33
d	When larval population is more	100.00	100.00

**Table.3** Correlation coefficient (r) between technological gap of chickpea among small and marginal farmers with their independent variables

n= 120

Sl. No.	Independent variables	Small farmers (n <sub>1</sub> = 60)	Marginal farmers (n <sub>2</sub> = 60)
1	Age	0.180 <sup>NS</sup>	0.090 <sup>NS</sup>
2	Education	-0.372 <sup>**</sup>	-0.303 <sup>**</sup>
3	Farming experiences	-0.213 <sup>**</sup>	0.060 <sup>NS</sup>
4	Land holding	0.043 <sup>NS</sup>	-0.097 <sup>NS</sup>
5	Annual income	0.101 <sup>NS</sup>	-0.355 <sup>**</sup>
6	Cropping intensity	-0.168 <sup>*</sup>	-0.187 <sup>*</sup>
7	Household materials	-0.102 <sup>NS</sup>	0.050 <sup>NS</sup>
8	Farm implements	0.229 <sup>NS</sup>	0.198 <sup>NS</sup>
9	Livestock possession	0.024 <sup>NS</sup>	0.193 <sup>NS</sup>
10	Extension participation	-0.268 <sup>*</sup>	-0.144 <sup>NS</sup>
11	Extension contact	0.004 <sup>NS</sup>	-0.378 <sup>**</sup>
12	Mass media participation	0.042 <sup>NS</sup>	0.046 <sup>NS</sup>
13	Social participation	-0.153 <sup>*</sup>	-0.034 <sup>NS</sup>
14	Cosmo politeness	-0.058 <sup>NS</sup>	0.012 <sup>NS</sup>
15	Scientific orientation	-0.176 <sup>*</sup>	0.048
16	Innovativeness	-0.092 <sup>NS</sup>	-0.236 <sup>*</sup>
17	Achievement motivation	-0.243 <sup>**</sup>	-0.031 <sup>NS</sup>
18	Economic motivation	0.130 <sup>NS</sup>	-0.204 <sup>**</sup>
19	Risk orientation	0.214 <sup>NS</sup>	0.109 <sup>NS</sup>
20	Management orientation	0.049 <sup>NS</sup>	0.093 <sup>NS</sup>

\*\*= Significant at 1 % level    \* = Significant at 5 % level    NS = Non Significant



With respect to fertilizer application, thirty five and forty per cent of gap was observed among small farmers in application N and P application. Whereas 51.67 and 71.67 per cent of gap existed among marginal farmers. From the above findings it could be concluded that technological gap in more in marginal farmers. This may be due to their less land holding and poor economic conditions, they were unable to apply the recommended quantity of chemical fertilizer.

With regard to integrated pest management, cent per cent of both small and marginal farmers did not follow the practices like mechanical beating of plants, erection of bird perches and pheromone traps. This may be due to lack of knowledge about the above said practices and majority of the farmer belonged to medium cosmopolitanism in nature.

**Correlation coefficient (r) between technological gap of chickpea crop among small and marginal farmers with their independent variables**

The data depicted in the Table 3 that, In case of small farmers, education and farming

experiences were found negatively significant at 1 per cent level of probability. The other variables found negatively correlated and significant at 5 per cent level of probability were cropping intensity, extension participation, social participation and scientific orientation with technological gap. The table also revealed that, In case of marginal farmers, education, annual income and economic motivation of were found negatively significant at 1 per cent level of probability. Further, the variables which were negatively significant at 5 per cent level of probability are cropping intensity, extension participation and innovativeness.

From the above results the study could be concluded that, majority of the small farmers (83.33 %) and marginal farmers (43.33 %) of chickpea crop belonged to medium technological gap category. Whereas, meager per cent of the technological gap was observed among the small and marginal farmers of chickpea in the practices like soil type, land preparation, sowing season, varieties, seed rate, spacing and hand weeding and huge technological gap was observed in application of FYM, intercultivation, use of

herbicides, growth regulator and nipping. With regard to integrated pest management, cent per cent of both small and marginal farmers did not follow the practices like mechanical beating of plants, erection of bird perches and pheromone traps. Over all technological gap with respect adoption of improved cultivation practices of chickpea were medium has indicated the vast potential for improving the adoption level of improved cultivation practices by chickpea growers. This calls for planning of integrated extension strategies by convergence of Karnataka State Department of Agriculture, State Agricultural Universities, Private extension organizations and NGOs to reduce technological gap.

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