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RESEARCH ARTICLE :

Study on knowledge and adoption of green gram production technology by farmers in Chhotaudaipur district of Gujarat

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SUMMARY : Farmers had average knowledge about improved practices of green gram cultivation in the Chhotaudaipur district of Gujarat. Farmers possessed comparatively more knowledge about high yielding varieties and time of sowing. Minimum knowledge was possessed in plant protection measures and fertilizer application in greengram cultivation and majority of greengram growers were in medium adoption group followed by low and high adoption group. Greengram growers adopted high yielding variety, seed rate and spacing and time of sowing. Minimum adoption was found in fertilizer application and plant protection measures of improved greengram production technology. The majority of farmers belonged to the middle age group *i.e.*, between 30-54 years. It was further found that 63.0 farmers belonged to the up to secondary category of educational level. The majority of farmers were having more than 2.00 ha land followed by small farmers and marginal farmers in the study sample. It was also found that 88.00 per cent farmers belonged to have more Rs. 24000 income per annu).The 30.00 per cent of farmers were no member of any organization followed by member of one organization (45%) and office bearer of organization (25%).

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BACKGROUND AND OBJECTIVES

Pulses are the main source of protein particularly for vegetarians. The per capita availability of pulses declining fast from 56 g per day in 1968 to 32 gram per day as on 2014 against the minimum requirement of 70 g per day as prescribed by ICMR (Anonymous, 2014).

Greengram (*Vigna radiata* L. Wilczek) belongs to the family leguminaceae and sub-family papilionaceae. It is a small herbaceous annual plant growing to a height of 30 to 100 centimetre with a slight tendency to twining in the upper branches. The crop is fully self-fertile and self-pollinated chromosomes are 2n = 24. Greengram are small, cylindrical beans with a bright green skin. In ayurvedic cooking, it is used as a whole or, more commonly, split and hulled. Split and hulled greengram are small and yellow and called mung (moong) dhal in India. These beans

Table A : Area, production and productivity of greengram in Major States in 2013-14

Sr. No.	Particulars	Area (lakh ha)	% Share	Production (lakh t)	% Share	Productivity (kg ha^{-1})
1	Andhra Pradesh	4.40	12.79	2.17	15.50	493.18
2	Gujrat	2.30	6.69	1.21	8.64	526.09
3	Karnataka	5.28	15.35	1.08	7.71	204.55
4	Maharashtra	6.71	19.51	3.71	26.50	552.91
5	Uttar Pradesh	0.72	2.09	0.40	2.86	555.56
6	Rajasthan	10.60	30.81	4.16	29.71	392.45
7	Tamil Nadu	1.71	4.97	0.55	3.93	321.64
8	Orissa	2.55	7.41	0.62	4.43	243.14

Source : Vital Statistics, Ministry of Agriculture, GoI-2013-14

don't need pre-soaking and are a snap to cook to butter-soft consistency if you have a pressure cooker. They can also be cooked in a slow cooker or on the stovetop. They greengram should be sorted and washed thoroughly before cooking.

Greengram are one of the most cherished foods in ayurveda. They are tridoshic-they can be eaten to balance all three doshas, especially when cooked with spices appropriate for each dosha. They are very nourishing, while being relatively easy to digest-they do not generally create abdominal gas or bloating, as the drawbacks of larger beans. Persons recuperating are often recommended khichari, a combination of rice and greengram, because of their ability to provide a good level of nourishment without overtaxing the digestion. They offer the astringent taste. According to modern nutrition, greengram offer 14 g of protein per cooked cup. Greengram are also a good source of dietary fiber. They also contain thiamin, iron, magnesium, phosphorus, potassium and copper, and are a good source of folate.

Greengram can be eaten solely, or combined with rice to make khichari, or combined with vegetables and greens to make hearty soups or grind into flour to be used to make crepes or added to breads. Turmeric, cumin, dried ginger and coriander are some spices that work very well with greengram.

The total production of pulses in the world was 14.76 billion tonnes from the area of 14.25 billion hectares in the year 2013-14 while while in India total pulses production was about 17.52 million tons of green gram annually from about 3.4 million hectares of area, with an average productivity of 500 kg per hectare (Vital Statistics, Ministry of Agriculture, GOI-2013-14). Green gram output accounts for about 10-12 per cent of total pulse production in the country. There is a distinct change in production pattern of greengram across states. Traditionally Rajasthan, Maharashtra and Andhra Pradesh are major green gram producing states. But there is significant rise in production from other states in recent years particularly from Gujarat, Karnataka, Tamil Nadu and Uttar Pradesh.

Numbers of steps has been initiated by the central/ state government to boost-up the production of oil seeds and pluses crop. There are several transfer of technology projects of the ICAR like the All India Coordinated Project on National Demonstration (AICPND), Operation Research Project (ORP), Krishi Vigyan Kendra (KVK) and Lab to Land Programme (LLP) and National Pulse Production Scheme (NPPS) in which are enhancing the production of greengram at farmers field by providing latest technical know-how at farmers level.

Presently, production of greengram is slow down due to several factors while demand of pulses especially greengram was increased and the price of greengram is too high to purchased a person belonging to average income groups. Front Line Demonstration Programme was launched in 1991 by the ICAR. This programme had completed 25 years'. Hence, it was felt to know the impact of latest package of practices of greengram which were demonstrated at farmer's field with close supervision of scientist. Keeping in view the importance of the study and low productivity of greengram, it was considered worthwhile to find out how much this programme had helped the greengram growers to bring about change in their knowledge, adoption of greengram production technologies and increase the farm productivity and what are the factors which impede in enhancing the greengram production.

RESOURCES AND METHODS

The study was conducted in Chhotaudaipur district of Gujarat, total 6 talukas of the district five talukas were selected basis on the area under greengram cultivation

and then Two villages were selected from each talukas on basis of maximum area under green gram cultivation after then selected 10 villages a sample of 100 greengram growers has been made in such a manner that the number of greengram growers selected from each village has been proportionate to the total number of greengram growers of the respective village.

Table B : Area and production of greengram during 2013-14 of talukas

Sr. No.	Villages	Area (ha)	Total production (MT)
1.	Naswadi	350.00	195.65
2.	Sankheda	315.00	189.00
3.	Bodeli	150.00	83.85
4.	PaviJetpur	100.00	55.95
5.	Chhotaudaipur	75.00	41.92
6.	Kawant	10.00	5.59

Source: District Agri Office, District Panchayat-2013-14

OBSERVATIONS AND ANALYSIS

The results obtained from the present investigation have been presented in the following sub heads:

Knowledge of farmers about improved practices of green gram cultivation:

Farmer's knowledge with regard to improved package of practices was measured terms of mean percent score. As many as 10 practices were included to assess the knowledge as given in Table 1.

Data (Table 1) show that farmers had very good amount of knowledge (above 75%) about time of sowing and high yield varieties with 84.00 and 83.00 MPS, farmers had good amount of knowledge (above 50%) regarding irrigation management, seed rate and spacing, harvesting, threshing and storage, field preparation, seed treatment and weed management with 3rd, 4th, 5th, 6th, 7th and 8th ranks, respectively and like fertilizer application with MPS 48.00 and plant protection measures with 21.00 MPS were found least knowledge (less than 50%).

Majority (57 %) of farmers had medium level of knowledge while 29.00 per cent fell under the low level of knowledge, followed by high level (14 %) knowledge regarding improved agricultural practices of green gram production practices (Table 2).

Extent of adoption of farmers about green gram production technology :

Adoption is a mental process. In the modern era many new things are being invented by our agricultural scientists but all the innovations are not being adopted by many of the members of social system. Adoption of an innovation depends on many factors *viz.*, awareness and knowledge of adopters, innovativeness characteristics, complexity and visibility of innovation. It is generally assumed that if an individual has more knowledge about different aspects of technologies he is likely to adopt the innovations with higher speed. The results regarding the extent of adoption of green gram production technology are narrated here under:

Distribution of farmers according to the extent of adoption:

The ranges of adoption score obtained by farmers were found wide spread. In order to have a closer look, the range of score was divided into three categories and data were reset to find out the frequency and percentage

Table 1 : Level of knowledge of farmers regarding greengram production technology **(n=100)**

Sr. No.	Package of practices	Farmers	
		MPS	Rank
1.	High yielding varieties	83.00	II
2.	Field preparation	59.00	VI
3.	Seed treatment	53.00	VII
4.	Time of sowing	84.00	I
5.	Seed rate and recommended spacing	66.00	IV
6.	Fertilizer application	48.00	IX
7.	Irrigation management	71.00	III
8.	Weed management	50.00	VIII
9.	Plant protection measures	21.00	X
10.	Harvesting, threshing and storage	61.00	V
	Overall	59.60	

in each category. The data have been reported in Table 3.

Table 3 shows that farmers adoption level was very high (above 75%) about time of sowing with 76.00 MPS. Farmers had good amount of adoption level (above 50%) regarding high yielding varieties, irrigation management, field preparations, seed rate and spacing, harvesting, threshing and storage and seed treatment. Other practices like weed management and fertilizer application adoption level were observed with less than 50 per cent and least adoption was found in plant protection measures practices.

The overall extent of adoption level for greengram production technology by the farmers was 53.00.

The data (Table 4) revealed that 10.00 per cent farmers were high adopters, 51.00 per cent farmers were medium level adopters and 39.00 per cent farmers were in the category of low adopters of greengram production technology in the study area.

Conclusion :

Farmers possessed comparatively more knowledge about high yielding varieties and time of sowing. Minimum knowledge was possessed in plant protection measures and fertilizer application in green gram cultivation. Majority of green gram growers were in medium adoption group followed by low and high adoption group. Greengram growers adopted high yielding variety, seed rate and spacing and time of sowing. Minimum adoption was found in fertilizer application and plant protection measures of improved green gram production technology.

Table 2 : Distribution of farmers according to their level of knowledge **(n= 100)**

Sr. No.	Level of knowledge	Farmers	
		F	%
1.	Low (below 28 score)	29	29.00
2.	Medium (28 to 39 score)	57	57.00
3.	High (above 39 score)	14	14.00
	Overall	100	100

X =33.5 σ 5.5 F= Frequency ; %= Percentage

Table 3 : Extent of adoption of greengram production technology of farmers **(n=100)**

Sr. No.	Package of practices	Farmers	
		MPS	Rank
1.	High yielding varieties	69.00	II
2.	Field preparation	57.00	IV
3.	Seed treatment	50.00	VII
4.	Time of sowing	76.00	I
5.	Seed rate and spacing	57.00	IV
6.	Fertilizer application	42.00	IX
7.	Irrigation management	58.00	III
8.	Weed management	47.00	VIII
9.	Plant protection measures	20.00	X
10.	Harvesting, threshing and storage	50.00	VI
	Overall	52.60	

Table 4 : Distribution of farmers according to their extent of adoption **(n=100)**

Sr. No.	Extent of adoption	Farmers	
		F	%
1.	Low (below 23 score)	39	39.00
2.	Medium (23 to 29 score)	51	51.00
3.	High (above 29 score)	10	10.00
	Overall	100	100

$\overline{X}$ =26 σ 3 F= Frequency; %= Percentage

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