

**RESEARCH ARTICLE :**

A study on constraints perceived by the farmers in adoption of moongbean production technology in Vadodara and Chhotaudaipur district of Gujarat

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SUMMARY : Mungbean 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 mungbean. Study revealed that majority of respondents (60.00 %) perceived constraints moderately, 23.00 per cent perceived constraints upto high extent whereas, remaining 17.00 per cent perceived constraints upto low extent regarding following improved package of practices of moongbean cultivation. It is recommended that intensive efforts be made to conduct more number of FLDs on moongbean production technology so as to bring more farmers under FLDs umbrella. Thus the difference as depicted in the study results with regards to knowledge and adoption. In view of the findings, it is suggested that subject matter specialist of K.V.K., should visit the field more frequently and assure that the adoption of all the practices (as a package) at the farmer's field.

KEY WORDS :

Moongbean,
Constraints,
Adoption, Production
technology

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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 gram 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).

Mungbean [*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 $2n = 24$. Mungbean 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 mungbean are small and yellow and called mung (moong) dhal in India. These beans don't need pre-soaking and are a snap to cook to butter-soft consistency if you have a pressure cooker.

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They can also be cooked in a slow cooker or on the stovetop. They mungbean should be sorted and washed thoroughly before cooking.

The total production of pulses in the world was 14.76 billion tonnes from the area of 14.25 billion hectares in the year 2008-09 while in India total pulses production was 14.76 million tonnes from the area of 23.63 million hectares in the year 2007-08. Whereas in Gujarat, the total pulses production was 1.55 million tonnes from the area of 3.78 million hectares. The mungbean production among pulses was 3.73 tonnes from the area of 8.85 Lakh hectares in Gujarat in the year 2008-09. The major cultivation of mungbean is based upon rainfed conditions (Govt. of Gujarat, 2008-09).

Vadodara district stands first rank in term of area and production of mung bean in the state. In this district, the mungbean crop is grown in an area of 1796 ha with an annual production of over 1029.68 MT. (Govt. of Gujarat, 2013-14).

Number 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 Co-ordinated Project on National Demonstration (AICPND), Operation Research Project (ORP), Krishi Vigyan Kendra (KVK) and Lab to Land Programme (LLP), National Pulse Production Scheme (NPPS) which are enhancing the production of mungbean at farmers field by providing latest technical know-how at farmers level.

The result of demonstrations had remained the effective medium of extension of technology in India since 1952 when the community development programme was started, since then; the concept of result demonstrations had gone many changes including its theory, principles and objectives.

The latest concept in this series is “front line demonstration” which is new concept of field demonstration evolved by the ICAR with the inception of the technology mission on oilseed and pulses crops in mid nineteen eighty.

The field demonstrations conducted under the close supervision of the scientists of the National Agricultural Research System are called Front Line Demonstration because the technologies are being demonstrated for the first time by the scientists themselves at farmer’s field before, it is fed into the main extension system of the state department of agriculture to test the feasibility,

suitability and potentiality of evolved variety and /or technology.

RESOURCES AND METHODS

Locale of study and sampling procedure :

The study was conducted in Vadodara and Chhotaudaipur district of Gujarat. The Vadodara and Chhotaudaipur were selected purposely for the present investigation due to the following reasons:

Krishi Vigyan Kendra, Vadodara is located in the study area which are very good sources of information for the green gram growers.

Selection of talukas:

A list of 13 talukas was prepared. Out of these, 6 talukas were selected having highest area under green gram cultivation for the study purpose (Table A).

Table A : Area and production of moong during 2013-14 of taluka wise

Sr. No.	Villages	Area (ha)	Total production (MT)
1.	Dabhoi	525.00	293.475
2.	Naswadi	350.00	195.65
3.	Sankheda	315.00	189.00
4.	Waghodiya	132.00	75.465
5.	Bodeli	150.00	83.85
6.	Savli	100.00	73.72
7.	PaviJetpur	114.00	55.95
8.	Vadodara	25.00	15.06
9.	Chhotaudaipur	75.00	41.92
10.	Kawant	10.00	5.59
11.	Padra	00.00	Not grown
12.	Karjan	00.00	Not grown
13.	Shinor	00.00	Not grown

Source : District Agri Office, District Panchayat-2013-14 (Taluka head quarter Vadodara)

Selection of villages :

A list of green gram growing villages in the 6 taluka. Out of these villages from each taluka having highest area under green gram cultivation villages selected for the study purpose.

Selection of respondents :

To select the sample of respondents for the study, initially a list of all green gram growers was prepared from each of the selected village with the help of Talati

Table B : Selection of villages and the respondents

Name of Tehsil selected	Total no. of moong growing villages	No. of villages selected	Name of selected villages	Total no. of moong growers	No. of respondents selected
Dabhoi	61	10	1. Vasai	16	6
			2. Timbi	41	15
Waghodiya	17		3. Goraj	31	11
Bodeli	10		4. Navapura	39	14
			5. Kathmandwa	18	8
Pavi-Jetpur	11		6. Ambalak	15	6
Sankheda	09		7. Saradiya	14	5
			8. Kasumbiya	41	15
Naswadi	08		9. Akona	27	10
			10. Kolambo	25	10
			Total	267	100

of the concerned village. from the selected 10 villages a sample of 100 green gram growers was selected in such a manner that the number of green gram growers selected from each village proportional to the total number of green gram growers of the respective village (Table B).

OBSERVATIONS AND ANALYSIS

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

Constraints perceived by the respondents in adoption of moongbean production technology :

As reported earlier there exists a glaring gap in level of knowledge and extent of adoption of moongbean production technology among both the categories of farmers. This necessitates to find out the probable constraints which hindrance the extent of adoption of improved practices of moongbean cultivation. All the possible constraints being faced by the respondents were grouped into six major categories viz., constraints related to inputs, finance, technical, environment, marketing output and miscellaneous constraints.

Distribution of respondents according to constraints perceived by them in adoption of moongbean production technology :

Table 1 shows that majority of respondents (60.00 %) perceived constraints moderately, 23.00 per cent perceived constraints upto high extent whereas, remaining 17.00 per cent perceived constraints upto low extent regarding following the improved package of practices of moongbean cultivation.

Constraints related to inputs as perceived by respondents regarding adoption of moongbean production technology :

A critical examination of Table 2 reveals that respondents were facing major problem of lack of irrigation facility (45.62 MPS) followed by unavailability of improved seed at the time of sowing (43.12 MPS) and unavailability of fertilizers at the peak season (33.12 MPS) in the adoption of improved moongbean production technology. Supply of inferior quality seed, unavailability of culture at time of sowing, unavailability of recommended chemicals for plant protection measures

Table 1 : Distribution of respondents according to constraints perceived by them in adoption of moongbean production technology (n=100)

Sr. No	Extent of constraints	Farmers	
		F	%
1.	Low (<26.69 score)	17	17.00
2.	Medium (26.69-46.99 score)	60	60.00
3.	High (>46.99 score)	23	23.00
	Total	100	100

X =36.84 10.15 F= frequency, % percentage

Table 2 : Constraints related to inputs as perceived by the moongbean growers in adoption of moongbean production (n=100)

Sr. No.	Constraints	Farmers	
		MPS	Rank
1.	Unavailability of improved seed at the time of sowing	43.12	II
2.	Supply of inferior quality seed	29.37	IV
3.	Unavailability of fertilizer at the peak season	33.12	III
4.	More requirement of fertilizers and manures	15.00	VII
5.	Unavailability of culture at time of sowing	23.12	V
6.	Unavailability of recommended chemicals for plant protection measures	18.12	VI
7.	Lack of irrigation facilities	45.62	I
Overall		29.64	

$r_s = 0.92^{**}$ $t = 5.28$ $r_s =$ Rank correlation; $**$ indicates significant of value at $P=0.01$

were ranked 4th, 5th and 6th, respectively. Least problems were faced by them was related to fertilizer and manure as requirement of these are very less as compared to another crops.

The value of rank order correlation r_s was 0.92. It indicates positive correlation. The calculated value of 't' (5.28) was higher than it's tabulated value at 1 per cent level of significance. This leads to conclusion that there is an association between the ranks assigned by moongbean growers in different aspects of inputs constraints inspite of difference in magnitude of mean per cent score.

Financial constraints perceived by the moongbean production technology :

A critical analysis of Table 3 reveals that respondents were facing much problem of high cost of fertilizer (70.00 MPS), malpractices of the merchants in the mandies (62.50 MPS), unavailability of procurement price of the product (60.63 MPS) and high cost of seed of high yielding varieties (51.88 MPS) in adoption of improved moongbean production technology. High cost of plant protection chemicals, unavailability of credit on marginal interest

and high cost of labour were ranked 5th, 6th and 7th, respectively.

The tabulated value of rank order correlation r_s was 0.84 which indicates positive correlation. The calculated value of 't' (3.56) was higher than it's tabulated value at 5 per cent level of significance. This leads to conclusion that there is association between the ranks assigned by moongbean growers in different aspects of financial constraints inspite of difference in magnitude of mean per cent score.

Technical constraints perceived by the respondents in adoption of moongbean production technology:

A critical examination of Table 4 reveals that lack of knowledge about plant protection measures (30.62 MPS), weed control through weedicides is complex practice (30.00 MPS) and lack of knowledge about quantity of fertilizer (26.87 MPS) were found as main reasons for non-adoption of moongbean production technology by overall respondents. Lack of knowledge about weed management, lack of skill for seed treatment, unavailability of technical advise as and when needed, ignorant about the advantages of culture and lack of

Table 3 : Financial constraints perceived by the farmers in adoption of moongbean production technology (n=100)

Sr. No.	Constraints	Farmers	
		MPS	Rank
1.	High cost of seed of high yielding variety	51.88	IV
2.	High cost of fertilizers	70.00	I
3.	High cost of plant protection chemicals	48.75	V
4.	High cost of labour	36.88	VII
5.	Unavailability of credit on marginal interest	37.50	VI
6.	Unavailability of procurement price of the product	60.63	III
7.	Malpractices of the merchants in the mandies	62.50	II
Overall		52.59	

$r_s = 0.84^*$ $t = 3.56$ $r_s =$ Rank correlation; * indicates significance of values at $P=0.01$

knowledge about recommended seed rate were ranked 4th, 5th, 6th, 7th and 8th, respectively as constraints for non-adoption of moongbean production technology by overall respondents.

To see the relationship between the ranks assigned by the farmers for realization of technical constraints in moongbean crop, the rank order correlation was calculated and tested by applying ‘t’ test. The value of ‘t’ for respondents was found non-significant which leads to the conclusion that there was difference in realization of technical constraints of moongbean growers.

Constraints related to environment perceived by the moong growers in adoption of moongbean production technology :

A critical examination of Table 5 reveals that respondents major problem of long dry spell, uncertainty of monsoon, erratic rainfall, scarcity of moisture in soil and cloudy weather at the time of flowering were perceived major environmental problems by all the respondents. These problems were also perceived as major constraints respondents with a little variation.

The problem like insect pests and disease infestation due to continuous rainfall and high susceptibility to insect-pest and disease were perceived very less by all the respondents.

Table further shows that the value of rank order correlation (r_s) was to be 0.86. It indicates positive correlation. The calculated value of ‘t’ (3.78) was higher than it’s tabulated value at 5 per cent level of significance, leading to conclusion that there is association between the ranks assigned by moongbean growers in different aspects of environmental constraints.

Marketing output constraints perceived by the respondents in adoption of moongbean production technology :

A critical examination of Table 6 reveals that respondents were facing major problems like, compulsion by village agent and mandi merchant, poor farmer’s co-operative structures (46.25 MPS), lack of storage facility (43.12 MPS), lack of government grain procurement facilities (42.50 MPS), manipulation by merchants (41.87 MPS) and lack of transport facility (41.25 MPS) in the

Table 4 : Technical constraints perceived by the farmers in adoption of moongbean production technology (n=100)

Sr. No.	Constraints	Farmers	
		MPS	Rank
1.	Lack of skill for seed treatment	21.25	V
2.	Lack of knowledge about weed management	23.12	IV
3.	Ignorant about the advantages of culture	13.12	VII
4.	Weed control through weedicides is complex practice	30.00	II
5.	Unavailability of technical advise as and when needed	18.12	VI
6.	Lack of knowledge about recommended seed rate	6.25	VIII
7.	Lack of knowledge about quantity of fertilizer	26.87	III
8.	Lack of knowledge about plant protection measures	30.62	I
Overall		21.17	

$r_s=0.26$ NS $t=0.66$ r_s = Rank correlation; NS= Non-significant

Table 5 : Constraints related to environment perceived by the moongbean growers in adoption of moongbean production technology (n=100)

Sr. No.	Constraints	Farmers	
		MPS	Rank
1.	Scarcity of moisture in soil	87.50	IV
2.	Uncertainly of monsoon	90.62	II
3.	Erratic rainfall	89.37	III
4.	Long dry spell	93.00	I
5.	Cloudy weather at the time of flowering	75.62	V
6.	Insect pests and disease infestation due to continuous rainfall	9.37	VI
7.	High susceptibility to insect pest and disease	10.00	VII
Overall		65.07	

$r_s=0.86^*$ $t=3.78$ r_s = Rank correlation; * indicates significance of value at $P=0.05$

adoption of moongbean production technology. Lower price at harvesting, non-declaration of purchase price before sowing seasons, absence of assured marketing remunerative price and insurance facility and problem of marketing in remote areas were ranked on 7th, 8th, 9th and 10th, respectively for non- adoption of moongbean production technology as perceived by the respondents.

The value of rank order correlation r_s was to be 0.68. It indicates positive correlation. The calculated value of 't' (2.64) was higher than it's tabulated value at 5 per cent level of significance. This leads to conclusion that there was association between the ranks assigned by

moongbean growers in different aspects of marketing output constraints inspite of difference in magnitude of mean per cent score.

Miscellaneous constraints perceived by the respondents in adoption of moongbean production technology :

A critical analysis of Table 7 reveals that respondents were facing more problems of grazing the crop by animals (49.37 MPS). To a least extent they perceived constraints regarding supply of inferior quality of moongbean seed by inputs dealers, do not believe in soil treatment, critical

Table 6 : Marketing output constraints perceived by the farmers in adoption of moongbean production technology (n=100)

Sr. No.	Constraints	Farmers	
		MPS	Rank
1.	Lack of storage facility	43.12	III
2.	Lack of transport facility	41.25	VI
3.	Compulsion by village agent and mandi merchant	46.25	I
4.	Lack of government grain procurement facility	42.50	IV
5.	Manipulation by merchants	41.87	V
6.	Poor farmers co-operative structures	46.25	II
7.	Problems of marketing in remote areas	7.50	X
8.	Lower price at harvesting	22.50	VII
9.	Absence of assured marketing remunerative price and insurance facility	11.87	IX
10.	Non-declaration of purchase price before sowing season	16.25	VIII
Overall		31.94	

$r_s = 0.68^*$ $t = 2.64$ $r_s =$ Rank correlation; * indicates significance of value at $P=0.05$

Table 7 : Miscellaneous constraints perceived by the farmers in adoption of moongbean production technology (n=100)

Sr. No.	Constraints	Farmers	
		MPS	Rank
1.	Supply of inferior quality of moongbean seed by inputs dealers	20.00	II
2.	Do not believe in soil treatment	11.25	IV
3.	Problem of grazing animals	49.37	I
4.	Critical stage of irrigation is not known	16.87	III
5.	Application of weedicides reduce the availability of fodder	4.37	V
Overall		20.37	

$r_s = 0.90^*$ $t = 3.58$ $r_s =$ Rank correlation; * indicates significance of value at $P=0.05$

Table 8 : Overall constraints perceived by the farmers in adoption of moongbean production technology (n=100)

Sr. No.	Constraints related to	Farmers (n=100)	
		MPS	Rank
1.	Input constraints	26.64	IV
2.	Financial constraints	52.59	II
3.	Technical constraints	21.17	V
4.	Environmental constraints	65.07	I
5.	Marketing output constraints	31.94	III
6.	Miscellaneous constraints	20.37	VI
Overall		36.80	

$r_s = 0.94^{**}$ $t = 5.53$ $r_s =$ Rank correlation; ** indicates significance of value at $P=0.01$

stage of irrigation is not known and application weedicides reduce the availability of fodder.

The value of rank order correlation r_s was to be 0.90. It indicates positive correlation. The calculated value of 't' (3.58) was higher than its tabulated value at 5 per cent level of significance. This leads to conclusion that there was association between the ranks assigned by moongbean growers in different aspect of miscellaneous constraints.

Overall constraints perceived by the respondents in adoption of moongbean production :

The data in Table 8 reveals that among the six categories of constraints, environmental constraints were perceived with highest intensity. This was followed by financial constraints, marketing output constraints and input constraints by the respondents. Further, technical constraints and miscellaneous constraints were perceived least by the respondents.

The value of rank order correlation (r_s) was to be 0.94. It indicates positive correlation. The calculated value of 't' (5.53) was higher than its tabulated value at 1 per cent level of significance, which leads to the conclusion that there was association in realization of moongbean growers.

Conclusion :

– Farmers perceived more constraints for environment, financial, marketing output and input constraints in adoption of improved moongbean production technology. Technical and miscellaneous constraints were perceived least in adoption of moongbean production technology by the respondents.

– There was association between ranks assigned by moongbean growers in different aspects of input, financial, marketing output, environment and miscellaneous constraints.

– They suggested that demonstration should be conducted at all the farmers fields in village instead of some selected farmers and more training programmes should be conducted during demonstration.

– On the basis of findings it is suggested that the technological constraints can be minimized by assuring availability of fertilizers and acquiring skill for seed treatment by the respondents. Therefore, the state department of agriculture should take the responsibility to make available the fertilizer and seed at the required

time to the moongbean growers and see that they acquire perfection in seed treatment.

– Lack of suitable agencies for providing loans to the farmers in the study was reported. Obviously the financial constraints repel the moongbean growers for adoption of high cost involved technology of moongbean cultivation. It is therefore, recommended that the rural regional banks and cooperatives societies should come forward for help to the poor farmers by providing them loans on nominal rates of interest. Likewise, to get rid of the problems of quality input supply as expressed by the respondents, it is recommended that the government should purchase the total harvest of the area by paying reasonable procurement prices and supply the improved quality inputs at the proper time at reasonable cost.

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