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Adoption of mung bean production technology among farmers in Jabalpur district of Madhya Pradesh

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Abstract
The present study was conducted in Kundam block of Jabalpur district, Madhya Pradesh to know the socio-economic characteristics of mung bean growers and their adoption level. The sample size was 120 for the study spread over 12 villages of Kundam block. For the study independent variables namely age, socio economic status (SES), caste, occupation, education, land holding, social participation, house, farm power, material possession, family type and size, mass media exposure, extension participation, risk preference, annual income and area under mung bean crop were selected. The data revealed that majority of mung bean growers (52.50%) had medium adoption level followed by (40.83%) had low adoption level and only 6.67 per cent had high adoption level about mung bean production technology. The variable age, socio economic status (SES), occupation, education, land holding, social participation, farm power, family type, family size, extension participation, risk preference, annual income and area under mung bean crop had positive and significant relationship with adoption level of mung bean growers while caste, house, material possession and mass media exposure had non-significant relationship with adoption level.

Keywords: adoption level, Socio-economic characteristics and mung bean growers

Introduction
Mung bean [*Vigna radiata* (L.) Wilczek.] belongs to family Leguminosae. It is a small, much branched herbaceous plant rarely exceeding 60 cm height. The botanical description of main part of mung bean plant is given as mung bean has a well-developed root system. The roots usually include a central strong tap root with numerous lateral branches the spread out in all directions in the upper layer of soils are numerous nodules on roots. The rhizobium bacteria present in their nodules fix up atmospheric nitrogen.

Mung bean known in this country for long time. It is said to be one of the oldest pulse crops known and cultivated from ancient times both in Asia and in Europe. Its probable place of origin lies in Central Asia that is in the country lying to the north-west of India such as Afghanistan Persia According to Vavilov mung bean is a native of Indian and Central Asia.

The important mung bean growing countries are India, China, Myanmar, Indonesia, Pakistan, Thailand and Bangladesh. The global mung bean area is about 7.3 million ha and global output is about 5.3 million tons (2015-17) with India and Myanmar each supplying about 30% of this, China 16%, and Indonesia 5%. India is one of the leading mung beans producing countries mainly cultivated in almost all the stats i.e. Rajasthan, Maharashtra, Karnataka, Madhya Pradesh, Odisha, Tamil Nadu, Bihar and Gujarat.

In Madhya Pradesh during Twelfth Plan (2012-2017) the total area covered under mung bean 2.51 lakh ha with 1.16 lakh tones total production and productivity was 464 kg/ha (Annual Report DPD 2016-17).

In the Jabalpur district the total area covered under mung bean around 1000 ha, production was 627 tonnes and productivity were 450 kg/ha (Office of Deputy Director of Agriculture Jabalpur). Knowledge has been found to be an important factor contributing to adoption of recommended technology by the farmers.

Several high yielding varieties like Pusa Baishakhi, K-851 and PDM 54 (Moti) are available with the farmers but a wide gap is conspicuous in the actual potentiality of the variety (Chandra,2010), the reasons for which need to be ascertained. Constraints are the circumstances or causes, which prohibit farmer to adopt improved farm technology. It was ascertained by asking open-end questions to the respondent farmers regarding the different factors, which were responsible for non-adoptions of recommended cultivation practices.

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Since adoption pattern of mung bean cultivation is of utmost importance for increasing the production as well as productivity levels this study was undertaken to know the adoption level of mung bean growers, problems and suggestions to overcome them.

Methodology

The present study was carried out in Kundam block of Jabalpur district in Madhya Pradesh. In this block, there were 180 existing villages, out of which only twelve villages were selected randomly. A total number of 120 respondents those were selected through random sampling method on the criteria of mung bean growers were interviewed personally for data collection. The socio-economic characteristics of the respondents were studied on basis of SES (Socio Economic Scale) with suitable modifications. The adoption test was constructed based on the package of practices developed for mung bean cultivation. List of 8 cultivations practices on the package of practices and practices contain total 26 statements was administered to total respondents. The response was collected on the three-point continuum *viz.* complete adoption, partial adoption and no adoption. With a scoring pattern of statements may be given the scores as complete adoption -2, partial adoption -1 and no adoption -0. The respondents are grouped in three categories i.e. low, medium and high adoption level. Collected data were classified, tabulated and analysed by using statistical methods like frequency, percentage and correlation coefficient.

Result and Discussions

Table 1: Practice wise adoption level of improved production technology of mung bean crop among the selected growers.

S. No.	Particulars	Mean	Rank
1	Field preparation management.	3.20	II
2	Seed and sowing management.	5.05	I
3	Fertilizers management	2.84	V
4	Irrigation management.	1.80	VIII
5	Insect and disease management	2.95	IV
6	Weed management	2.70	VI
7	Harvesting	3.19	III
8	Storage management	2.11	VII

Table 2: Adoption level of mung bean growers (n=120)

S. No.	Categories	Frequency	Percentage
1	Low (Up to 17 score)	49	40.83
2	Medium (18 to 34 score)	63	52.50
3	High (Above 35 score)	8	6.67
	Total	120	100.00

Table 2 shows that majority of the respondents (52.50%) were medium adoption level about improved mung bean production technology followed by low (40.83%) and high (6.67%) adoption level, respectively. So that majority of the adoption level of practices of mung bean cultivation fall in the medium category.
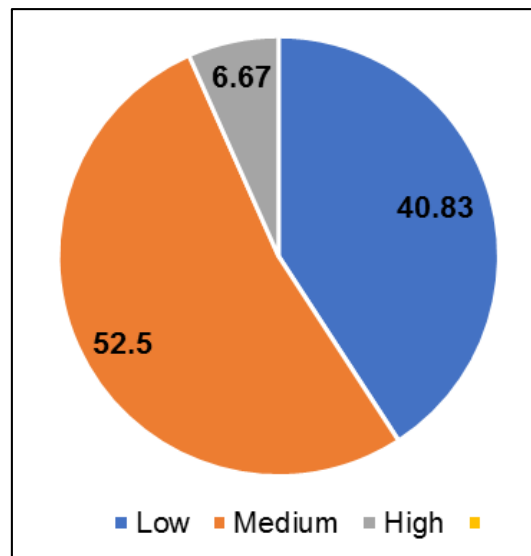
Fig 1: Distribution of respondents according to their adoption level

Table 3: Problem faced by the mung bean growers and suggestion to overcome them:

S. No.	Problems statements	Frequency	Percentage	Rank
A	**Situational problems**			
	Irregular supply of electricity	89	74.16	I
	Non-availability of sufficient water for irrigation	81	67.50	II
	Lack of labour	76	63.33	III
	Market is away from village	62	51.66	IV
	Lack of means of transportation	53	44.16	V
B	**Technological problems**			
	Lack of knowledge about improved varieties	79	81.66	I
	Lack of knowledge about insects and diseases	69	57.50	II
	Lack of knowledge about seed treatment	51	42.50	III
C	**Economic problems**			
	High cost of input like manure, seeds, fertilizers, equipment, diesel etc.	94	78.33	I
	Lack of money to purchase agricultural inputs	81	67.50	II

	Higher charges of laborers	74	61.66	III
	High rate of interest on loan	67	55.83	IV
	Procedure of loaning is very complex	54	45.00	V
D	**Market related problems**			
	Low price of their product in the market	86	71.66	I
	Delayed payment in the market	79	65.83	II
	Regular market facilities in their locality	74	61.66	III
	Lack of knowledge about product price	68	56.66	IV
	Irregular supply of manure, seed, fertilizer and pesticides	64	53.33	V
E	**Extension related problems**			
	Irregular visit of RHEOs in the village	103	85.83	I
	RHEOs should provide technical guidance	97	80.83	II
	Lack of crop demonstration on farmers field	83	69.16	III
	Lack of training program about advanced technology	76	63.33	IV

The problems as expressed by the majority of the farmers were facing the problem of irregular supply of electricity (74.16%) followed by non-availability of sufficient water for irrigation (67.50%), lack of labours (63.33%). Market is away from village (51.66%) and lack of means of transportation (44.16%) were ranked 4th and 5th respectively.

A critical analysis from table 3, in the technological problems reveal that the lack of knowledge about improved varieties (81.66%) followed by lack of knowledge about insects and diseases (57.50%) and Lack of knowledge about seed treatment (42.50%) were found as the main reason for non-adoption of the mung bean production technology by overall respondents.

The financial problems reveal that the respondents were facing much problem of high cost of input like manure, seeds, fertilizers, equipment, diesel etc (78.33%) followed by lack of money to purchase agricultural inputs (67.50%), higher charges of laborers (61.66%). High rate of interest on loan (55.83%) and Procedure of loaning is very complex (45.00%) were ranked 4th and 5th respectively.

The 1st in the market related problems, the respondents were facing the problems of ow price of their product in the market (71.66%) followed by delayed payment in the market (65.83%), Regular market facilities in their locality (61.66%), lack of knowledge about product price (56.66%) and Irregular supply of manure, seed, fertilizer and pesticides (53.33%).

A critical analysis from table 3, in the Extension related problems reveal that the farmers were facing the main problems of irregular visit of RHEOs in the village (85.83%) followed by

RHEOs should provide technical guidance (80.83%), lack of crop demonstration on farmers' field (69.16%) and lack of training programmes about advanced technology (63.33%) respectively.

Table 4: Suggestions given by mung bean growers:

S. No.	Suggestion statements	Frequency	Percentage	Rank
1	Regular visit of RHEOs	109	90.83	I
2	Technical knowledge should be given by RHEOs	104	86.66	II
3	Electricity should be available on time	98	81.66	III
4	Knowledge about proper amount seed treatment and pesticides	88	73.33	IV
5	Training should be conducted for technical mung bean production	75	62.50	V
6	Demonstration should be conducted in the field by the department of agriculture	71	59.16	VI
7	Agriculture implement should be given on time	68	56.66	VII

Table 4 indicated about the rank of suggestions in mung bean production technology as perceived by the growers. It is clear from the data that the maximum percentage in this suggestion was in regular visit of RHEOs (90.83%), technical knowledge should be given by RHEOs (86.66%), electricity should be available on time (81.66%), Knowledge about proper amount seed treatment and pesticides (73.33%), Training should be conducted for technical mung bean production (62.50%), demonstration should be conducted in the field by the department of agriculture (59.16%) and agriculture implement should be given on time (56.66%).

Conclusion
From the above results it can be concluded that majority (52.50%) farmers belonged to medium adoption category followed by 40.83 per cent belonged to low adoption level. Minority of the farmers had adopted improved varieties, recommended seed rate, spacing, time of sowing and method of sowing. So, in this condition there is a need to increase the knowledge and interest of the farmers that increase the level of adoption. They suggested that the regular visit of RAEOs in the village so they can acquire more knowledge about improved mung bean production technology and electricity must be available on time and knowledge about proper amount seed treatment and pesticides, department of agriculture should be conducted demonstration on the farmers filed that increase the farmers attitude towards mung bean production technology. 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 mung bean growers and see that they acquire perfection in seed treatment.

The study suggests that the above practices which had low adoption by farmers should give due attention by extension agencies, so that the existing level of adoption of such practices can be increased.

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