FACTORS INFLUENCING THE ADOPTION OF MUNG BEAN PRODUCTION TECHNOLOGY IN ARID ZONE OF RAJASTHAN

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ABSTRACT

The study was conducted in four districts namely Jodhpur, Pali, Bikaner and Jaisalmer of Rajasthan. Two Panchayat Samities, from each District and from each Panchayat Samiti, one village and from each village 18 mung bean growing farmers were selected randomly and thus the total sample size was 144. The data were collected through structure interview schedules. The study revealed that majority (74.30%) farmers belonged to medium adoption category. Out of sixteen variables, two variables i.e. occupation and knowledge were found to be positively and significantly correlated with adoption of mung bean production technology. The 16 independent variables jointly taken together explained 48.64 % of the variation in adoption of mung bean production technology. The study suggests that the practices like seed treatment, application of nitrogenous and phosphatic fertilizers and plant protection measures which had low adoption by farmers should be given due attention by extension agencies, so that the existing level of adoption of such practices can be increased.

INTRODUCTION

Mung bean is an important kharif pulse crop of Rajasthan, it occupies about 8.86 lakh hectares area, which accounts for 24.13 per cent of total pulse area of the state but contribute only 20.44 per cent to total pulse production of the state. Mostly, it is grown under rainfed condition. The average productivity of mung bean in the state is 421 kg/ha(2008-09), which is very low as compared to its potentiality. The reason for low productivity may be traditional methods of cultivation practices by the farmers. With development of high yielding varieties and better management practices, there is much scope for further increase in yield. Keeping this in view, the present study was under taken with specific objectives: to study the extent of adoption of mung bean production technology by the farmers and to find out the relationship between socio-economic characteristics and adoption of mungbean production technology.

RESEARCH METHODOLOGY

The study was conducted in 4 districts namely Jodhpur, Pali, Bikaner and Jaisalmer of Rajasthan. Two Panchayat Samities, namely Bilada and Osian from Jodhpur district, Rohet and Jetaran Panchayat Samities from Pali district, Nokha and Lunkaran Panchayat Samitis from Bikaner district and Pokharan and Jaisalmer Panchayat Samiti from Jaisalmer district were selected randomly. From each Panchayat Samiti one village and from each village 18 farmers were selected randomly. Thus the sample was 144. The data were collected through specially developed interview schedules.

For studying the extent of adoption 9 important cultivation practices i.e. improved varieties, seed rate, seed treatment, time of sowing, method of sowing, spacing, application of nitrogenous fertilizers, application of phosphatic fertilizers and plant protection measures were considered. Scores '0', '1' and '2' assigned to non-adoption, partial adoption and full adoption respectively. On this basis total adoption score of each respondent was worked out and the respondents were classified by cumulative square root frequency technique into low, medium and high adoption level.

Sixteen independent variables namely age, education, caste, occupation, land holding, irrigation facility, type of family, size of family, farming experience, annual income, extension contact, source of information, economic motivation,

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scientific motivation, risk orientation and knowledge were computed for correlation co-efficient in order to find out their relationship with the dependent variable; adoption.

The extent of adoption was calculated by the adoption index developed by Karthikeyan (1994). The adoption index of the farmers for the selected practices was worked out by using the following formula.

$$AI = \frac{\text{Respondents' total score}}{\text{Total possible score}} \times 100$$

Here, AI represents adoption index

Respondents' total score = Total number of practices adopted by farmers multiplied by respective practices weightage and summated

Total possible score = Total number of practices recommended multiplied by the respective weightage and summated.

RESULTS AND DISCUSSION

Practice wise extent of adoption of mung bean production technology

The responses received from the respondents were categorized as low (up to 33.33 %), medium (33.34 to 66.66 %) and high adoption (above 66.66 %). Practice wise extent of adoption of mung bean production technology is presented in Table 1.

Data presented in table 1 indicates that majority (53.47%) of respondents were found in medium adoption category followed by low (25.0%) and high adoption category (21.53%). Low adoption of improved varieties may be due to non-availability of improved varieties seed at proper time and lack of knowledge. With regards to recommended seed rate, 9.72, 39.58 and 50.69 per cent respondents were observed to be in low, medium and high adoption category respectively.

With respect to seed treatment, majority (87.50%) of respondents were found in low adoption category. Similar findings reported by Singh and Chauhan (2010). This might be due to lack of knowledge regarding seed treatment. It was observed that 9.03, 50.69 and 40.28 per cent respondents were observed to be in low, medium and high adoption category respectively in case of

time of sowing. With regards to method of sowing, majority (80.55%) of respondents were found in high adoption category. In case of spacing, majority (84.72%) of respondents were found in high adoption category followed by medium (12.50%) and low adoption category (2.77%)

With regards to application of nitrogenous and phosphatic fertilizers, majority of the farmers (93.75 and 90.97 %) were found in low adoption category. Similar findings reported by Singh and Chauhan (2006) and Singh and Chauhan (2010). Thakre and Tiwane (1994) found that only 4.50 per cent farmers applied nitrogenous fertilizers as per recommended dose. Possible reason for low adoption might be lack of irrigation facilities, high cost of fertilizers, lack of knowledge and lack of finance.

In respect to plant protection measures, majority (86.80%) of respondents were found in low adoption category. It might be due to lack of knowledge, lack of technical guidance and high cost of plant protection chemicals

Table 2 showed that over all 74.30 per cent farmers belonged to medium adoption category. The percentage of low and high adoption was 15.28 and 10.42 per cent respectively.

Relationship between socio-economic characteristics of the farmers and adoption of mung bean production technology

To find out the relationship between socio-economic characteristics and adoption of mung bean technology, correlation coefficient was worked out and presented in Table 3. A perusal of Table 3 indicated that knowledge of the farmers was positively and significantly correlated with adoption of mung bean production technology. This reveals that as the level of knowledge increased their adoption of mung bean production technology also increased. The above finding is in line with the findings of Pathak and Sasmal (1992), Choudhary and Singh (1997), Lakhera, and Sharma (2002) and Singh (2004).

Correlation of other variables like age, education, caste, land holding, irrigation facilities, type of family, size of family, experiences, annual income, extension contact, sources of information,

Table1. Extent of adoption of mung bean production technology by the arid zone farmers

S. No.	Practices	Extent of adoption		
		Low (Up to 33.33%)	Medium (33.34 to 66.66%)	High (Above 6.66%)
1.	Improved varieties	36 (25.00)	77 (53.47)	31 (21.53)
2.	Recommended seed rate	14 (9.72)	57 (39.58)	73 (50.69)
3.	Seed treatment	126 (87.50)	16 (11.11)	2 (1.38)
4.	Time of sowing	13 (9.03)	73 (50.69)	58 (40.28)
5.	Method of sowing	3 (2.08)	25 (17.36)	116 (80.55)
6.	Spacing	4 (2.77)	18 (12.50)	122 (84.72)
7.	Application of nitrogenous fertilizer	135 (93.75)	9 (6.25)	0 (0.00)
8.	Application of phosphatic fertilizer	131 (90.97)	13 (9.03)	0 (0.00)
9.	Plant protection measures	125 (86.80)	15 (10.42)	3 (2.08)

(Figures in parenthesis indicates percentage)

Table 2. Distribution of farmers according to their overall adoption of mungbean production technology in Rajasthan

S. No	Adoption level	Number	Percentage
1.	Low (Below 33%)	22	15.28
2.	Medium (34 to 66%)	107	74.30
3.	High (Above 66%)	15	10.42
	Total	**144**	**100.00**

Table 3. Correlation between socio- economic characteristics of the respondents and adoption of mung bean production technology

S.No.	Socio- economic characteristics	Correlation co-efficient (r)
1.	Age	0.00 NS
2.	Education	.01154 NS
3.	Caste	.01656 NS
4.	Occupation	.19225*
5.	Land holding	-.02724 NS
6.	Irrigation facilities	.12031 NS
7.	Type of family	.15293 NS
8.	Size of family	.18837 NS
9.	Experiences	.10845 NS
10.	Annual income	.07724 NS
11.	Extension contact	.04143 NS
12.	Source of information	.05391 NS
13.	Economic motivation	.07156 NS
14.	Scientific motivation	.04240 NS
15.	Risk orientation	.03840 NS
16.	Knowledge	.46874**

* -Significant at 5 % level; **- Significant at 1 % level; N.S.= Non -significant

Table 4. Regression coefficient between independent variables and adoption of mung bean production technology

S. No.	Independent variables	Reg. coefficient ('b' value)	Standard error	't' value
1.	Age	-0.03181	0,02895	-1,09886
2.	Education	0.04586	0,45395	0,10102
3.	Caste	0.31206	0,37710	0,82752
4.	Occupation	1.40773	0,60380	2,331438
5.	Land holding	0.017005	0,00844	2,01298*
6.	Irrigation facilities	1.50048	0,57437	2,61236**
7.	Type of family	0.60239	0,58749	1,02536
8.	Size of family	0.09622	0,06963	1,38176
9.	Experiences	0.03783	0,03151	1,20021
10.	Annual income	0.00704	0,00524	1,34354
11.	Extension contact	0.25224	0,34708	0,72673
12.	Sources of information	-0.01134	0,06804	-0,16673
13.	Economic motivation	0.43013	0,19625	2,19170*
14.	Scientific motivation	-0.22667	0,17461	-1,29816
15.	Risk orientation	-0.00733	0,17899	-0,04097
16.	Knowledge	0.35378	0,05923	5,97219**

R2 =48.64, R = .6974, F = 4.405766, * -Significant at 5 percent level; ** -Significant at 1 percent level

economic motivation, scientific motivation and risk orientation of farmers with adoption were not significant.

Regression analysis:

The results of regression analysis between the independent variables and adoption of farmers regarding mung bean production technology are given in Table 4. The results revealed that all the sixteen independent variables taken together explained 48.64 per cent of the variation for adoption. Thus, the respective 'F' value 4.40639 was significant at 1 percent level of probability. The results implied that all the sixteen variables had accounted for significant amount of variation for adoption.

Further, it was also observed that 't' test of significance expressed in coefficient of regression 'b' value were positively significant for occupation, land holding, irrigation facilities, economic motivation and knowledge at 1 per cent level of probability. On the contrary, coefficient of regression 'b' value were non-significant for age, education, caste, type of family, size of family, farming experience, annual income, extension contact, scientific motivation and risk orientation.

The indepth analysis of the relationship between dependent and independent variables proved that occupation, land holding, irrigation facilities, economic motivation and knowledge of the farmers were most important variables among all the sixteen selected variables in the study, which were predictors of adoption.

CONCLUSION

From the above results it can be concluded that majority (74.30%) farmers belonged to medium adoption category. Majority of the farmers had adopted improved varieties, recommended seed rate, spacing, time of sowing and method of sowing, to a great extent, while seed treatment, application of nitrogenous and phosphatic fertilizers and plant protection measures to a lesser extent. Out of sixteen variables, two variables occupation and knowledge were found to be positively and significantly correlated with adoption of mung bean production technology.

The study suggests that the practices seed treatment, application of nitrogenous and phosphatic fertilizers and plant protection measures which had low adoption by farmers should given due attention by extension agencies, so that the existing level of adoption of such practices can be increased.

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