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Farmer's Knowledge About Moth bean Production Technology in Arid Zone of Rajasthan

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Abstract: The study was conducted in two panchayat samitis of Jodhpur district of Rajasthan. From each panchayat samiti three villages and from each village 30 moth bean growing farmers each, 10 marginal, small and large were selected randomly. The total number of farmers were 60 marginal, 60 small and 60 large. The study revealed that majority of the marginal, small and large farmers' possessed fair knowledge regarding seed technology of moth bean and poor knowledge regarding fertilizer and plant protection technology. Over all majorities of the marginal, small and large farmers possessed fair knowledge regarding moth bean production technology. Out of twelve variables age of the marginal, small and large farmers was negatively and significantly correlated with knowledge of moth bean production technology while caste, education, social participation, mass media exposure, contact with extension agencies and infrastructure facilities were positively and significantly correlated with knowledge. The education of the farmers was found most important predictor of knowledge.

Key words: Moth bean, knowledge, seed treatment, plant protection measures.

Moth bean [*Vigna aconitifolia* (Jacq.) Marechal] is one of the important kharif pulse crop of Rajasthan as it occupies about 15.93 lakh ha area. It shared about 33.51% of total pulse area of Rajasthan, but contributes only 23.81% of the total production of the state. Mostly, it is grown under rainfed condition. The productivity of moth is very low 288 (2013-14) (486 kg ha^{-1}) 384 (2010-11) in comparison to other pulse crops in the state i.e. mung bean 360 (621 kh ha^{-1}), urd 555 (737 kg ha^{-1}), chaula 649 (529 kg ha^{-1}) and arhar (758 kg ha^{-1}) (Rajasthan Agricultural Statistics at a glance for the year 2013-14). The low yield shows that new technologies generated at Research Institute and Agricultural University have not been integrated into farming practices of the farmers in order to convert them into production accomplishment. Many factors are responsible for low yield of the crop. Among them, knowledge of moth bean production technology is one of the important factors in boosting up the productivity of moth bean. Keeping this in view, the present study was under taken to study the knowledge of the farmers regarding moth bean production technology and to find out the relationship between socio-economic characteristics of moth growers and their knowledge of moth bean production technology.

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Materials and Methods

The study was conducted in Jodhpur district of Rajasthan. The list of all panchayat samities of Jodhpur district was prepared, out of nine panchayat samities, only two panchayat samities namely Mandore and Bhopalgarh were selected randomly. In each panchayat samiti, all the villages were divided into three categories according to the distance from the panchayat samiti. First category of the villages were within 0 to 3 km distance from the panchayat samiti. Second category were 3 to 6 km distance from the panchayat samiti and third category were more than 6 km distance from the panchayat samiti. One village from each category was selected randomly. Thus a total of 6 villages formed the sample of the study.

Total number of farm families in each selected villages were listed and classified into three farm size group viz marginal (upto 3.5 ha un-irrigated), small (3.51 to 7.0 ha un-irrigated) and large (more than 7 ha un-irrigated) with the help of Lekhpal and Village Development Officer (VDO) of the concerned village. Ten farm families from each marginal, small and large farm size group were selected by random sampling method. Thus, the selected respondents were 60 marginal, 60 small and 60 large. The total number of selected 180 respondents formed the sample of the study. The data were collected using pre-tested

Table 1. Knowledge of the farmers regarding seed technology of moth bean

Knowledge	Type of farmers						Total	
	Marginal		Small		Large			
	F	%	F	%	F	%	F	%
Poor knowledge	4	6.7	1	1.6	2	3.3	7	3.9
Fair knowledge	45	75.0	37	61.7	41	68.4	123	68.3
Good knowledge	11	18.3	22	36.7	17	28.3	50	27.8
Total	60	100.0	60	100.0	60	100.0	180	100.0

F = Frequency, % = Percentage.

structured schedule by personal interview method.

The knowledge test executed to the respondents, consisted 39 statements pertaining to high yielding varieties, seed treatment, seed rate, time of sowing, method of sowing, spacing, application of organic manure, interculture and weeding, application of nitrogenous and phosphatic fertilizers and plant protection measures. The responses were recorded either as "correct" or "incorrect" and a score of "1" and "0" were given respectively. The maximum score was 39 and minimum was 0.

Results and Discussion

Knowledge of the farmers regarding moth bean production technology

The whole technology of moth bean cultivation was divided into three aspects i.e. seed technology, fertilizer technology and plant protection technology. In the seed technology, HYV seed, seed rate, seed treatment, time of sowing, method of sowing, spacing, interculture and weeding were considered. Based on the responses of the respondents, three levels of knowledge, namely poor (up to 33.3%), fair (33.4 to 66.6%) and good (above 66.6%) were made.

Knowledge of the farmers regarding seed technology of moth bean.

An explicit of Table 1, it is evident that overall 3.9% farmers possessed poor knowledge, 68.3% fair and 27.8% possessed good knowledge regarding seed technology. Among the marginal farmers, 75.0% farmers possessed fair knowledge followed by good (18.3%) and poor knowledge (6.7%) regarding seed technology. It was found that majority of the small farmers (61.7%) were having fair knowledge regarding seed technology. However, 36.7% farmers were having good knowledge and only 1.6% were having poor knowledge. In case of large farmers, 3.33, 68.34 and 28.3% farmers were having poor, fair and good knowledge, respectively regarding seed technology of moth bean. Similar findings also reported by Singh (2003).

Knowledge of the farmers regarding fertilizer technology of moth bean

An examination of Table 2 shows that overall 58.9% farmers were having poor knowledge, 32.8% fair and 8.3% were having good knowledge regarding fertilizer technology of moth bean. It was found that majority of the marginal farmers (73.3%) were having poor knowledge followed by fair (20.0%) and good knowledge (6.7%) regarding fertilizer technology. Among the small farmers, 46.7, 40.0 and 13.3% farmers were having poor, fair and good knowledge, respectively regarding fertilizer technology. In case of large farmers, 56.7% farmers were having poor knowledge, 38.3% fair and 5.0% were having good knowledge. The above

Table 2. Knowledge of the farmers regarding fertilizer technology of moth bean

Knowledge	Type of farmers						Total	
	Marginal		Small		Large			
	F	%	F	%	F	%	F	%
Poor knowledge	44	73.3	28	46.7	34	56.7	106	58.9
Fair knowledge	12	20.0	24	40.0	23	38.3	59	32.8
Good knowledge	4	6.7	8	13.3	3	5.0	15	8.3
Total	60	100.0	60	100.0	60	100.0	180	100.0

F= Frequency, %= Percentage.

Table 3. Knowledge of the farmers regarding plant protection technology of moth bean

Knowledge	Type of farmers						Total	
	Marginal		Small		Large			
	F	%	F	%	F	%	F	%
Poor knowledge	50	83.3	44	73.3	46	76.7	140	77.8
Fair knowledge	10	16.7	13	21.7	9	15.0	32	17.8
Good knowledge	-	-	3	5.0	5	8.3	8	4.4
Total	60	100.0	60	100.0	60	100.0	180	100.0

F= Frequency, %= Percentage.

findings are in conformity with the finding reported by Singh (2003).

Knowledge of the farmers regarding plant protection technology of moth bean.

The data presented in the Table 3, indicated that overall 77.8% farmers possessed poor knowledge, 17.8% fair knowledge and only 4.4% farmers possessed good knowledge regarding plant protection technology. Among the marginal farmers, majority (83.3%) of the farmers possessed poor knowledge. However, 16.7% farmers possessed fair knowledge regarding plant protection technology. It was found that 73.3% small farmers possessed poor knowledge followed by fair (21.7%) and good knowledge (5.0%). In case of large farmers, 76.7, 15.0 and 8.3% farmers possessed poor, fair and good knowledge, respectively regarding moth bean production technology. Similar findings also reported by Singh (2003).

Distribution of respondents according to their overall knowledge regarding moth bean production technology

The data given in Table 4 revealed that overall majority (60%) farmers were having fair knowledge followed by poor knowledge (28.9%) and good knowledge (11.1%). Among the 33.33% marginal farmers were having poor knowledge, 58.4% fair and only 8.3% were having good knowledge regarding moth bean production technology. In case of small and large farmers, majority of farmers i.e. 60.0 and 61.7% were having fair knowledge. However, 25.0% small farmers and 28.3% large farmers were having poor knowledge and 15.0 and 10.0% were having good knowledge about the moth bean production technology. It may be concluded that on the whole majority of marginal, small and large farmers had fair knowledge regarding moth bean production technology.

There findings are in conformity with the findings of Bhople and Akolkar (1994); Singh *et al*. (1996); Agarwal *et al*. (1997); Singh (2003); Shinde (2002); Waman *et al*. (2003); Singh and Chauhan (2003); Singh (2004-05); Singh and Chauhan (2009); Singh *et al*. (2012).

Relationship between socio-economic characteristics of the marginal, small and large farmers and knowledge of the respondents regarding moth bean production technology

The relationship between socio-economic characteristics of the marginal, small and large farmers and knowledge of the respondents regarding moth bean production technology was found out by using correlation coefficient. The data presented in Table 5 shows that age of all three categories of the farmers was negatively and significantly correlated with knowledge of the moth bean production technology. It clearly

Table 4. Distribution of respondents according to their overall knowledge regarding moth bean production technology

Knowledge	Type of farmers						Total	
	Marginal		Small		Large			
	F	%	F	%	F	%	F	%
Poor knowledge	20	33.3	15	25.0	17	28.3	52	28.9
Fair knowledge	35	58.4	36	60.0	37	61.7	108	60.0
Good knowledge	5	8.3	9	15.0	6	10.0	20	11.1
Total	60	100.0	60	100.0	60	100.0	180	100.0

F= Frequency, %= Percentage.

Table 5. Relationship between socio-economic characteristics of the marginal, small and large farmers and knowledge of the respondents regarding moth production technology

Socio-economic characteristics	Correlation coefficient (r)		
	Marginal farmers	Small farmers	Large farmers
Age	-0.3570**	-0.2542*	-0.3428**
Caste	0.4121**	0.3159*	0.2591*
Education	0.7666**	0.9164**	0.8784**
Family type	-0.2385	-0.2168	-0.2077
Family size	-0.2110	-0.2082	-0.1600
Size of holding	-0.0153	-0.2302	0.1840
Occupation	0.0176	-0.0330	-0.1290
Per capita annual income	0.0731	0.0571	0.2236
Social participation	0.4268**	0.4135**	0.7477**
Mass media exposure	0.6801**	0.8217**	0.8476**
Contact with extension agencies	0.6943**	0.7111**	0.7853**
Infrastructure facilities	0.7056**	0.7080**	0.7199**

* = Significant at 0.05 level of significance.
** = Significant at 0.01 level of significance.

indicates that old farmers had less knowledge about moth cultivation. It may be due to less education. Similar finding also reported by Singh (2003), Singh and Chauhan (2003) and Singh (2004-05).

Caste of the marginal, small and large farmers was positively and significantly correlated with knowledge of the farmers. It is inferred that lower caste of the farmers had low knowledge as compared to higher caste. This finding is in conformity with the finding of Singh (1991).

Education of all three categories of the farmers i.e. marginal, small and large had positive and significant relationship with knowledge. It clearly shows that less educated farmers had less knowledge of moth bean production technology as compared to educated farmers. The finding is in line with the findings of Singh (1991); Singh *et al.* (1996); Ramesh and Santha (2003); Singh and Chouhan (2003).

Social participation of all three categories of the farmers was positively and significantly correlated with knowledge. It shows that those farmers having more social participation their knowledge is also increases. This finding is in conformity with the findings of Singh (1991).

Contact with extension agencies of the marginal, small and large farmers was positively and significantly correlated with knowledge. It clearly indicated that increase in extension contact helped in increasing the knowledge of the farmers regarding moth bean production technology. The finding is in conformity with the findings of Singh (1991), Pulamate and Rameshbabu (1993); Ramesh and Santha (2003).

Mass media exposure of the all the three categories of the farmers had shown positive and significant relationship with knowledge. It clearly shows that farmers with more mass media exposure had more knowledge of moth bean cultivation. This finding is also supported by Pulamate and Remeshbabu (1992).

Infrastructure facilities of the various categories of farmers i.e. marginal, small and large was positively and significantly correlated with knowledge. It shows that farmers with better infrastructure facilities had more knowledge about moth bean production technology. Similar finding is also reported by Singh (1991).

Family type, family size, size of holding, occupation and per capita annual income of the marginal, small and large farmers were found non-significant with knowledge of the farmers regarding moth bean production technology. It revealed that these variables had no impact on the knowledge.

Regression analysis

Table 6 elicited that all the twelve independent variables taken together explained 65.63% of the variation for knowledge of the

Table 6. Regression coefficient between independent variables and knowledge of marginal, small and large farmers regarding moth production technology

Independent variables	Marginal farmers		Small farmers		Large farmers	
	Reg. coefficient ('b' value)	't' value	Reg. coefficient ('b' value)	't' value	Reg. coefficient ('b' value)	't' value
Age	0.0154	0.1409	0.1071	1.5897	-0.0692	-0.8307
Caste	0.5117	0.5992	-0.1668	-0.2761	-0.1973	-0.2507
Education	1.5996	1.7213*	3.3745	5.3223**	1.7749	1.9776*
Family type	1.3963	0.8088	-1.2056	-1.2915	-1.0008	-0.5717
Family size	-0.0787	-0.0466	0.4935	0.4244	1.9654	1.1405
Size of holding	1.2391	0.8663	-1.2154	-1.1969	-0.4622	-0.3479
Occupation	-0.2252	-0.5382	-1.0671	-1.2219	0.1442	1.7144
Per capita annual income	0.7690	1.2245	0.3740	1.1980	0.0239	0.2271
Social participation	1.8961	1.0560	-1.5620	-1.2549	2.4836	1.5206
Mass media exposure	-0.1870	-0.2931	0.3114	0.6836	1.2048	1.7890*
Contact with extension agencies	0.4803	0.9454	-0.1961	-0.5845	0.0608	0.1208
Infrastructure facilities	0.7713	1.1683	0.1142	0.2775	0.3790	0.8184

R2 = 65.63. F = 6.8723**. R2 = 88.08. F = 26.1652**. R2 =78.68. F = 13.0645**.

marginal farmers. Thus the respective 'F' value 6.872399** was significant at 1% level of probability. The results implied that all thirteen variables had accounts for significant amount of variation for knowledge. Further, it was also observed that 't' test of significance expressed in coefficient of regression 'b' value were positively significant for education at 5% level of probability. On the contrary, coefficient of regression 'b' value were non- significant for other variables

Regarding small farmers, all the twelve independent variables taken together explained 88.08% of the variation for knowledge. Thus the respective 'F' value 26.1652** was significant at 1% level of probability. The results implied that all the thirteen variables had accounts for significant amount of variation for knowledge. Further, it was also observed that 't' test of significance expressed in coefficient of regression 'b' value were positively significant for education at 1% level of probability. On the contrary, coefficient of regression 'b' value were non-significant for other variables

In case of large farmers, all the twelve independent variables taken together explained 78.68% of the variation for knowledge. Thus the respective 'F' value 13.0645** was significant at 1% level of probability. The results implied that all the thirteen variables had accounts for significant amount of variation for knowledge. Further, it was also observed that 't' test of significance expressed in coefficient of regression 'b' value were positively significant for education and mass media exposure at 5% level of probability. On the contrary, coefficient of regression 'b' value were non- significant for other variables. The results of the analysis were indicated of the facts that education of the farmers was most important predictor of knowledge.

Conclusions

The majority of the marginal, small and large farmers possessed fair knowledge regarding seed technology of moth bean and poor knowledge regarding fertilizer and plant protection technology of moth bean. Over all majorities of the marginal, small and large farmers possessed fair knowledge regarding moth bean production technology. Out of twelve variables age of the marginal, small and large farmers was negatively and significantly correlated with knowledge of moth bean production technology while caste, education, social participation, mass media exposure, contact with extension agencies and infrastructure facilities were positively and significantly correlated with knowledge. The results of the analysis were indicated of the facts that education of the farmers was most important predictor of knowledge.

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