

Adoption of Moth Bean Production Technology in Arid Zone of Rajasthan

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Abstracts: The study was conducted in two panchayat samities of Jodhpur district of Rajasthan. From each panchayat samiti three villages and from each village 30 farmers, 10 each with marginal, small and large holdings were selected randomly. Majority of the marginal, small and large farmers belonged to low adoption category for the practices such as high yielding varieties, seed treatment, application of nitrogenous fertilizers, application of phosphatic fertilizers and plant protection measures, medium adoption for the practices like time of sowing, application of organic manure and interculture and weeding and high adoption for the practices such as seed rate, method of sowing and spacing of moth bean production technology. Age of the marginal, small and large farmers was negatively and significantly correlated with extent of adoption of moth bean production technology while education, mass media exposure, contact with extension agencies and infrastructure facilities were positively and significantly correlated with adoption.

Key words: Adoption, seed treatment, plant protection measures.

Moth bean, an important kharif pulse crop of Rajasthan, occupies about 7.72 lakh ha area, which accounts for 31.11% of the total pulse area in the state. It is grown under rainfed condition. The average productivity of moth bean in the state is 39.0 kg ha⁻¹ (1999-2000), which is very low as compared to other states. The low yield shows that new technologies developed have not been adopted by farmers. The present study was therefore undertaken to know the extent of adoption of moth bean production technology by farmers and to find out the relationship between socio-economic characteristics of the farmers and adoption of moth bean production technology.

Materials and Methods

The study was conducted in Jodhpur district of Rajasthan. Out of nine panchayat

samities, two panchayat samities namely Mandore and Bhopalgarh of Jodhpur and Bhopalgarh tehsils were selected randomly. In each panchayat samiti, all the villages were divided into three categories according to the distance from the panchayat samiti, near to the panchayat samiti (0 to 3 km), far from the panchayat samiti (3 to 6 km) and very far from the panchayat samiti (beyond 6 km). 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 village, were listed and classified into three-farm size group viz., marginal (upto 3.5 ha unirrigated), small (3.51 to 7.0 ha unirrigated) and large (more than 7 ha unirrigated) with the help of lekhpal and Village Level Worker (VLW) 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 during 1998 using pre-tested structured schedule by personal interview method.

The extent of adoption was calculated by the adoption index developed by Karthikeyan (1994) using the formula:

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

where,

AI represents adoption index,

Respondents total score = Total number of practices adopted by farmers multiplied by respective practice 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 moth bean production technology

The responses received from the respondents were categorized as low (up to 33.3%), medium (33.4 to 66.6%) and high adoption (above 66.6%). Practice wise extent of adoption of moth bean production technology is presented in Table 1.

High yielding varieties: Majority of the marginal farmers (88.3%) belonged to low adoption category (Table 1). However, 10.0% farmers belonged to high adoption category and 1.7% belonged to medium adoption category. Among the small farmers, 78.4% farmers belonged to low

adoption category followed by high (18.3%) and medium (3.3%) adoption category. In case of large farmers, 81.7, 10.0 and 8.3% farmers belonged to low, medium and high adoption category respectively. Singh *et al.* (2003) reported that 30% farmers adopted high yielding variety of moth bean. Low adoption might be due to non-availability of seeds of high yielding varieties, lack of knowledge and high cost of seed.

Seed rate: The data presented in Table 1 indicated that 45% marginal farmers were in medium adoption category and majority (55%) was in high adoption category. Among the small farmers, 51.7 and 48.3% farmers were in medium and high adoption category, respectively. In case of large farmers, majority of the farmers (60%) were in high adoption category and rest 40% in medium adoption category. Similar findings were also reported by Singh *et al.* (2003). It is very interesting to note that none of the marginal, small and large farmers were in low adoption category.

Seed treatment: Majority of the marginal farmers (98.3%) belonged to low adoption category and the rest (1.7%) belonged to medium adoption category. In case of small and large farmers, majority of the farmers (96.7% each) belonged to low adoption category and rest (3.3% each) were in medium adoption category. It was found that none of the marginal, small and large farmers belonged to high adoption category. Vijayraghavan *et al.* (1990) reported that only 12.5% farmers adopted seed treatment in cotton possibly due to lack of knowledge, technical guidance and high cost of fungicides.

Time of sowing: Table 1 shows that 60.0% marginal farmers were in medium

adoption category followed by high (28.3%) and low adoption category (11.6%). It was found that 58.4% small farmers were in high adoption category, 38.3% in medium

and only 3.3% farmers were in low adoption category. In case of large farmers, 6.7, 50.0 and 43.3% farmers were in low, medium and high adoption category,

Table 1. Extent of adoption of moth bean production technology

		Marginal	Small	Large
High yielding varieties	Low	53 (88.3)	47 (78.4)	49 (81.7)
	Medium	1 (1.7)	2 (3.3)	6 (10.0)
	High	6 (10.0)	11 (18.3)	5 (8.3)
Seed rate	Low	-	-	-
	Medium	27 (45.0)	31 (51.7)	24 (40.0)
	High	33 (55.0)	29 (48.3)	36 (60.0)
Seed treatment	Low	59 (98.3)	58 (96.7)	58 (96.7)
	Medium	1 (1.7)	2 (3.3)	2 (3.3)
	High	-	-	-
Time of sowing	Low	7 (11.7)	2 (3.3)	4 (6.7)
	Medium	36 (60.0)	23 (38.3)	30 (50.0)
	High	17 (28.3)	35 (58.4)	26 (43.3)
Method of sowing	Low	3 (5.00)	-	-
	Medium	9 (15.0)	14 (23.3)	11 (18.3)
	High	48 (80.0)	46 (76.7)	49 (81.7)
Spacing	Low	-	-	-
	Medium	2 (3.3)	-	-
	High	58 (96.7)	60 (100)	60 (100)
Application of organic manure	Low	37 (61.7)	17 (28.3)	22 (36.7)
	Medium	18 (30.0)	38 (63.4)	35 (58.3)
	High	5 (8.3)	5 (8.3)	3 (5.0)
Application of nitrogenous fertilizers	Low	59 (98.3)	55 (91.7)	55 (91.7)
	Medium	1 (1.7)	5 (8.3)	5 (8.3)
	High	-	-	1 (1.7)
Application of phosphatic fertilizers	Low	59 (98.3)	54 (90.0)	58 (96.7)
	Medium	1 (1.7)	6 (10.0)	2 (3.3)
	High	-	-	-
Interculture and weeding	Low	3 (5.0)	1 (1.6)	5 (8.3)
	Medium	42 (70.0)	40 (66.7)	43 (71.7)
	High	15 (25.0)	19 (31.7)	12 (20.0)
Plant protection measures	Low	60 (100.0)	57 (95.0)	57 (95.0)
	Medium	-	3 (5.0)	3 (5.0)
	High	-	-	-

Figures in parenthesis indicate the percentage of the respondents.

respectively. Similar findings of medium adoption of time of sowing reported by Singh (2001). Low adoption might be due to lack of moisture in the field, lack of sowing implements and lack of knowledge.

Method of sowing: 5.0, 15.0 and 80.0% marginal farmers belonged to low, medium and high adoption category respectively. Among the small farmers, majority of the farmers (76.7%) belonged to high adoption category and rest 23.3% belonged to medium adoption category. Similarly in case of large farmers, majority of the farmers (81.7%) belonged to high adoption category and rest 18.3% farmers belonged to medium adoption category. The above findings are in conformity with the findings of Singh *et al.* (2003) and Singh (2001). Low adoption may be due to lack of improved implements.

Spacing: Majority of the marginal farmers (96.7%) and all the small and large farmers were in high adoption category (Table 1). Only 3.3% marginal farmers were in medium adoption category. Similar findings of high adoption of spacing is reported by Nikhade *et al.* (1991).

Application of organic manure: Majority of the marginal farmers (61.7%) belonged to low adoption category followed by medium (30.0%) and high adoption category (8.3%). Among the small farmers, 28.3, 63.4 and 8.3% farmers belonged to low, medium and high adoption category, respectively. In case of large farmers, 36.7% farmers belonged to low adoption category, 58.3% medium and 5.0% farmers belonged to high adoption category. Low adoption might be due to lack of availability of organic manure and lack of finance.

Application of nitrogenous fertilizers: Table 1 showed that 98.3% marginal farmers

were in low adoption category and rest 1.7% in medium adoption category. In case of small and large farmers, majority of the farmers (91.7% each) were in low adoption category and 8.3% each small and large farmers were in medium adoption category. Thakre and Tiwane (1994) found that only 4.5% farmers applied nitrogenous fertilizers as per recommended dose. Low adoption may be due to lack of irrigation facilities, lack of knowledge, high cost of fertilizers and non-availability of credit.

Application of phosphatic fertilizers: Majority of the marginal farmers (98.3%) belonged to low adoption category and rest 1.7% farmers belonged to medium adoption category (Table 1). In case of small farmers, 90.0 and 10.0% farmers belonged to low and medium adoption category, respectively. It was found that majority of the large farmers (96.7%) belonged to low adoption category and 3.3% belonged to medium adoption category. It is very interesting to note that none of marginal, small and large farmer belonged to high adoption category. Acharya and Gupta (1982) reported that only 4.9% of the farmers applied phosphatic fertilizers to the pulses. Possible reason might be lack of irrigation facilities, high cost of fertilizers, lack of knowledge and lack of finance.

Interculture and weeding: Majority of the marginal farmers (70.0%) were in medium adoption category followed by high (25.0%) and low adoption category (5.0%). Among the small farmers, majority of the farmers (66.7%) were in medium adoption category, 31.7% in high and 1.6% farmers were in low adoption category (Table 1). In case of large farmers, 8.3, 71.7 and

Table 2. Distribution of respondents according to their overall adoption of moth bean production technology

Adoption	Type of farmers						Total	
	Marginal		Small		Large		F	%
	F	%	F	%	F	%		
Low adoption (upto 33.3%)	17	28.3	10	16.7	8	13.3	35	19.4
Medium adoption (33.4 to 66.6%)	43	71.7	47	78.3	50	83.4	140	77.8
High adoption (above 66.6%)	-	-	3	5.0	2	3.3	5	2.8
Total	60	100.0	60	100.0	60	100.0	180	100.0

F = Frequency.

20.0% farmers were in low, medium and high adoption category, respectively. Nikhade *et al.* (1991) found medium to high adoption of interculture and weeding.

Plant protection measures: All the marginal farmers belonged to low adoption category (Table 1). Among the small farmers, 95.0 and 5.0% farmers were in low and medium adoption category respectively. In case of large farmers, majority of the farmers (95.0%) belonged to low adoption category and 5.0% belonged to medium adoption category. It is very interesting to note that none of the marginal, small and large farmers belonged to high adoption category. Kunnal *et al.* (1984) state that only 2.4% farmers used plant protection measures in dry land sorghum. It might be due to lack of knowledge, lack of technical guidance and high cost of plant protection chemicals.

Overall adoption of moth bean production technology

Majority of the farmers (77.8%) had medium adoption of moth bean production technology (Table 2). The percentage of low and high adoption was 19.4 and 2.8, respectively. It was found that 71.7%

marginal farmers had medium adoption and rest 28.3% farmers had low adoption. In case of small and large farmers, majority of the farmers (78.3 and 83.3%) had medium adoption. However, 16.6 and 13.3% farmers had low and 5.0 and 3.3% farmers had high adoption of moth bean production technology.

Relationship between socio-economic characteristics and adoption of moth bean production technology

Age of the marginal, small and large farmers was negatively and significantly correlated with adoption which indicated that old farmers had less adoption of moth bean production technology as compared to young farmers (Table 3). It may be due to low education, enthusiasm and less mass media exposure. The above finding is supported by the findings of Gogoi and Gogoi (1989).

Education, mass media exposure and contact with extension agencies and infrastructure facilities of all three categories of farmers were positively and significantly correlated with adoption. Jat (1991) found education, mass media exposure and contact with extension agencies had positive and significant relationship with adoption of

Table 3. Relationship between socio-economic characteristics of the marginal, small, and large farmers and adoption of moth bean production technology

Socio-economic characteristics	Correlation coefficient (r)		
	Marginal farmers	Small farmers	Large farmers
Age	-0.3764**	-0.2574*	-0.2601*
Education	0.6742**	0.7838**	0.6320**
Family type	-0.1920	-0.1696	-0.2051
Family size	-0.2450	-0.1510	-0.0893
Size of holding	0.1179	-0.0283	0.2040
Occupation	0.2413	0.0327	-0.0940
Per capita annual income	0.0430	0.0612	0.2455
Mass media exposure	0.5909**	0.6820**	0.5923**
Contact with extension agencies	0.7163**	0.6269**	0.5972**
Infrastructure facilities	0.5270**	0.5986**	0.5061**

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

technology. Similar finding was also reported by Sumathi and Alagesan (1998). Sujatha and Annamalai (1998) found positive and significant relationship between infrastructure facilities and adoption.

Family type, family size, size of holding, occupation and per capita annual income of marginal, small and large farmers were non-significantly correlated with adoption. This clearly showed that these variables did not have any impact on adoption.

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