

Constraints in Adoption of Mothbean Production Technology in Arid Zone of Rajasthan

P. Singh¹, H.L. Jat² and J.P. Lakhera³

1. T.A., National Seed Project, S.K. Raj. Agri. University, Bikaner, 2. Asso. Prof., Department of Extension Education, S.K.N. College of Agriculture, Jobner (Rajasthan) 3. Asso. Prof., Directorate of Extension Education, SKRAU, Bikaner

Corresponding author e-mail: phoolsinghbagenia@rediffmail.com

ABSTRACT

The study was conducted in 19 villages of Bikaner and Churu districts of Rajasthan with the sample size of 316 mothbean growers. Results indicated that the mothbean growers in majority knew improved cultivation practices of mothbean and had adoption to the moderate extent. The study highlights that there are various of constraints which affect the process of adoption, however, few of them are most important one which affect the extent of adoption of recommended production technology of mothbean. The most importance were weed control through 'herbicides is technically complex phenomenon', 'lack of knowledge about improved technologies of seed, weedicides and plant protection measures', 'absence of assured marketing at remunerative price and insurance policy facility', 'lack of operational skill in the plant protection equipments' and 'sandy storm, high wind velocity and high temperature affect the growth of crop and productivity', 'unavailability of inputs at the time of peak season' and 'lack of water policy decided by the government'. The another important constraints least perceived by the farmers were labour charges are costly, lack of appropriate agronomical practices and low yield potential of prevalent varieties. Moreover, it was evident that with the increase in knowledge and adoption there is decrease in number of constraints face by mothbean growers.

Key words: Mothbean; Constraints; Extent of adoption; Production technology;

Pulses grown in scattered and specific agro-climatic, soil and input situations in all over India to meet varied requirements of inhabitants and livestock and legume, viz., clusterbean, cowpea, mothbean and horse gram have pivotal and unparallel role in harsher farming conditions.

These annual legumes are specifically known for sustaining production under extreme drier-eco systems, frequently encountered with harsh and hostile growing environments with unpredicted intensities and intervals. Need-based adaptations of these legumes towards inclement weathers have recognised them as the low priced source of livelihood of farmers surviving on resource constraint arid farming. Contribution of arid legume towards taming droughts, soil health build-up, diversification of agriculture and as a source of organic foods, have pushed them from secondary to front runner legumes of the developing arid and semi-arid regions.

In spite of great significance of these crops in the

region, national and climate logical context, their poor productivity is still a continued concern. Several controllable and uncontrollable reasons can be cited for stagnation in poor productivity of these legumes. Thus in view to bridge the gap between realized and required production of these crops; extensive research efforts are required at various levels. Research results of great practical and scholarly significance in genetic improvement, crop husbandry, plant protection and quality components have been generated.

Mothbean, the major arid legume and is recognized for its twin tolerance to drought and heat. It is therefore, the ultimate choice of marginal and sub-marginal farmers for realization of sustained production under the extreme hostile and harsh agro-climatic situations. Besides conserving soil and water, it is also used in several confectionary items, forming essential components of day to day snacks. Its green fodder is at par to alfalfa and dry fodder is better to cowpea and cluster bean. It

can provide 7-8 q/ha of hay. The crop is grown in plain land and on sanddunes and also in different combinations with crops, trees, fruit crops and grasses. Moth bean is grown in about 12.2 lakh hectares of area in Rajasthan of which, however, 93 per cent area (12.0 lakh ha) is confined to 12 arid districts of Rajasthan.

Mothbean is an important *kharif* season legume crop of Western Rajasthan and occupies about 54 per cent of the cultivated area under pulses in Rajasthan. However, the productivity in Rajasthan varies from 200 to 250 kg/ha.

Many constraints are responsible for low adoption of the technologies. Keeping this in view, a study was undertaken to find out the major constraints in adoption of improved package of practices of mothbean crop in arid area.

METHODOLOGY

Rajasthan state comprises ten agro-climatic zones. Out of these ten agro-climatic zones, the Zone-Ic was selected purposely for the study. As this zone is comprised of three districts, out of these, Bikaner and Churu districts were selected randomly. From the selected districts 50 per cent panchayat samities were selected randomly (four panchayat samities were selected out of eight panchayat samities). Ten per cent gram panchayats were selected randomly from selected panchayat samities and hence, 19 gram panchayats were selected. One village was randomly selected from each gram panchayat. A list of all the farmers who

were growing mothbean crop since last 5 years was prepared for each selected village. From the list of farmers so prepared 40 per cent respondents were selected randomly. Making a total sample of 316 respondents for the study purpose.

RESULTS AND DISCUSSION

Extent of knowledge of mothbean growers :The data regarding knowledge of mothbean growers about recommended cultivation practices of mothbean depicted in Table-1 revealed that more than two-third of mothbean growers possessed complete knowledge about recommended practices like use of improved seed, seed rate, sowing time, irrigation management, harvesting and storage measures and crop rotation. More than 50 per cent of the respondents knew completely about the field preparation and soil testing, weed management and plant protection measures to be undertaken in mothbean. However, more than 75 per cent of the mothbean growers possessed partial knowledge about recommended spacing and method of sowing, seed treatment, application of culture and fertilizers and its doses.

The composite knowledge about recommended cultivation practices of mothbean was observed to the extent of medium level in case (69.30 per cent) of mothbean growers. Quite a few (14.24%) of them were found to possess enough knowledge about recommended production technology of mothbean.

The findings s n accordance with findings of *Shnde et al.(2000)*.

Table 1: Knowledge of mothbean growers about recommended package of practices of mothbean

S.No.	Name of practices	Knowledge (N = 316)		
		Complete	Partial	No knowledge
1.	Field preparation and soil testing	192 (60.75)	124 (39.25)	0
2.	Use of improved seed	210 (66.45)	94 (29.76)	12 (3.79)
3.	Seed rate	253 (80.06)	55 (17.41)	8 (2.53)
4.	Sowing time	279 (88.30)	27 (8.54)	10 (3.16)
5.	Spacing and method of sowing	106 (33.55)	178 (56.33)	32 (10.12)
6.	Seed treatment	69 (21.83)	191 (60.44)	56 (17.73)
7.	Application of culture	59 (18.67)	181 (57.28)	76 (24.05)
8.	Nutrient management	126 (39.87)	123 (38.92)	67 (21.20)
9.	Irrigation management	212 (67.08)	104 (32.92)	0
10.	Weed Management	159 (50.32)	97 (30.70)	60 (18.98)
11.	Plant protection measures	187 (59.17)	106 (33.53)	23 (7.03)
12.	Harvesting and storage measures	221 (69.94)	95 (30.06)	0
13.	Crop rotation	213 (67.40)	103 (32.59)	0

(Figures in parenthesis indicate percentage)

Extent of adoption : A critical look at the data presented in Table - 2 clearly reveals that more than 60

per cent of the mothbean growers adopted completely the recommended practices like, use of improved seed,

sowing time, harvesting and storage measures and crop rotation. Moreover, the practices like field preparation & soil testing, seed rate and irrigation management were also found to adopted to a good extent by more than half of the respondents (52.22% to 57.28%). The recommendations related to weed management and seed treatment were partially adopted by more than fifty per cent mothbean growers under dry land to partially

irrigated conditions. However, more than 30 per cent of the respondents were partially adopted plant protection measures, field preparation and soil testing, irrigation management, nutrient management spacing and method of sowing and seed rate. However practices like application of culture, crop rotation and sowing time were partially adopted by less than 30 per cent of the respondents.

Table 2. Extent of adoption of recommended package of practices of mothbean by the mothbean growers

S.No.	Name of practices	Knowledge (N = 316)		
		Complete	Partial	No adoption
1.	Field preparation and soil testing	165 (52.22)	124 (39.25)	27 (8.53)
2.	Use of improved seed	198 (62.65)	65 (20.58)	53 (16.77)
3.	Seed rate	176 (55.70)	109 (34.49)	31 (9.81)
4.	Sowing time	209 (66.13)	84 (26.58)	23 (7.29)
5.	Spacing and method of sowing	46 (14.55)	124 (39.24)	146 (46.21)
6.	Seed treatment	38 (12.02)	209 (66.15)	69 (21.83)
7.	Application of culture	19 (6.02)	89 (28.16)	208 (65.82)
8.	Nutrient management	81 (25.63)	99 (31.32)	136 (43.05)
9.	Irrigation management	181 (57.28)	122 (38.60)	13 (4.12)
10.	Weed Management	75 (23.74)	175 (55.38)	66 (20.88)
11.	Plant protection measures	93 (29.43)	132 (41.78)	91 (28.79)
12.	Harvesting and storage measures	193 (61.07)	60 (18.98)	63 (19.95)
13.	Crop rotation	195 (61.70)	80 (27.84)	33 (10.44)

(Figures in parenthesis indicate percentage)

From the findings, it is worthy to note that the low cost and no cost practices were adopted to the fullest extent and the practices involving monetary inputs were partially adopted by the mothbean growers.

An overall adoption indicated that as much as 67.02 per cent of mothbean growers followed recommended cultivation practices.

The results of the present study are in line with the Chaudhary (1999) reported that in general improved practices of mothbean were adopted by majority of the farmers to a higher extent.

Constraints encountered in adoption of recommended mothbean technology : The constraints encountered by almost all the respondents in the adoption of recommended cultivation practices of mothbean under dry land conditions they were facing difficulty in adhering to the recommended time of sowing in absence of rainfall, high cost of fertilizers and plant protection chemicals which imposed restrictions on their use (Table 3).

The data in Table 3 reveals that 'Weed control through herbicides is technically complex phenomenon' was the most important constraint perceived by 92.72

per cent respondents. Hence, it was ranked first. The second, third, fourth, fifth and sixth ranks were assigned to the constraints 'Lack of knowledge about improved technologies of seed, weedicide and plant protection measures', 'absence of assured marketing at remunerative price and insurance policy facility', 'Lack of operational skill in the plant protection equipments', 'sandy storm, high wind velocity' and high temperature affect the growth of crop and productivity, 'unavailability of inputs at the time of peak season', with 89.24, 88.92, 86.39, 86.08 and 77.85 per cent respondents respectively.

Whereas constraints like, 'lack of water policy by the Government', 'uncertainty supply of canal water', 'inputs are costly, 'lack of cooperative marketing system', costly improved farm implements', fear of birds damage, lack of motivation from training institutions', were awarded seventh, eighth, ninth, tenth, eleventh, twelfth and thirteenth with 76.27, 74.05, 73.73, 73.10, 71.52, 70.25 and 69.62 per cent farmers respectively. Other important constraints were also perceived by the mothbean growers i.e. 'line sowing is costly operation and time consuming', 'lack of availability of quality seed',

Table 3: Major constraints perceived by the farmers in adoption of recommended mothbean production technology

S. No.	Major Constraints	No. of respondents	Mothbean	
			Percentage	Rank
1.	Unavailability of inputs at the time of peak season	246	77.85	VI
2.	Lack of knowledge about improved technologies of seed, weedicide and plant protection measures	282	89.24	II
3.	Impurity of seed and chemicals	208	65.82	XVI
4.	Uncertainty in supply of canal water	234	74.05	VIII
5.	Line sowing is costly operation and time consuming	217	68.67	XIV
6.	Improved farm implements are costly	226	71.52	XI
7.	Inputs are costly	233	73.73	IX
8.	Fertilizers create problems in the soil	197	62.34	XVIII
9.	Weed control through herbicides is technically complex phenomenon	293	92.72	I
10.	Lack of water policy decided by the Government	241	76.27	VII
11.	High charges for electricity and irregular supply	192	60.76	XIX
12.	Lack of operational skill in the plant protection equipments	273	86.39	IV
13.	Lack of availability of quality seed	210	66.46	XV
14.	Lack of motivation from training institutions	220	69.62	XIII
15.	Low yield potential of prevailing varieties	146	46.20	XXII
16.	Lack of appropriate agronomic practices	155	49.05	XXI
17.	Sandy storm, high wind velocity and high temperature affect the growth of crop and productivity	272	86.08	V
18.	Lack of cooperative marketing system	231	73.10	X
19.	Absence of assured marketing at remunerative price and insurance polity facility	281	88.92	III
20.	Labour charges are costly	165	52.21	XX
21.	Fear of birds damage in mothbean cultivation	222	70.25	XII
22.	Poor condition of farmers	203	64.24	XVII

'impurity of seed and chemicals', 'poor condition of farmers', 'fertilizers create problems in the soil', 'high charges for electricity and irregular supply', 'labour charges are costly' and 'lack of appropriate agronomical practices' were accorded rank fourteenth, fifteenth, sixteenth, seventeenth, eighteenth, nineteenth, twenty and twenty one with 68.67, 66.46, 65.82, 64.24, 62.34, 60.76, 52.21 and 49.05 per cent respondents respectively. The last rank was accorded to constraint 'low yield potential of prevalent varieties' specially RMO-40 with 46.26 per cent.

Among the major constraints in adoption of recommended production technology of mothbean cultivation 'Weed control through herbicides is technically complex phenomenon' and 'Lack of knowledge about improved technologies of seed, Weedicide and plant protection measures were the most perceived constraints. This might be due to the fact that most of recommended herbicides for mothbean cultivation are pre-emergence and pre-planting through this way application of herbicide is complex method, which might have long residual and phyto-toxic effect on succeeding crops. Low yield potential of prevalent

varieties as the least perceived constraint. This might be because, that most of the farmers were convinced with the performance of variety RMO-40, FMO-96 and RMO-225..

The findings are in accordance with the findings of Chaturvedi (2000), Singh and Waris (2002), Shinde *et al.* (2003), Khan and Chauhan (2005), Agrawal (2008) and Bankar (2008).

CONCLUSION

It can be concluded that the mothbean growers in majority knew improved cultivation practices of mothbean adopted to a moderate extent. Moreover, it was evident that with the increase in knowledge and adoption there is a decrease in number of constraints faced by mothbean growers. This trends to imply that more educational efforts are therefore, required to be undertaken by extension agency by way of organizing training and demonstrations for improvement of knowledge and increased adoption.

It can be further concluded that the constraints which were perceived most by the farmers in adoption of recommended production technology of mothbean

cultivation i.e. weed control through herbicide, is technically complex phenomenon constraint followed by lack of knowledge about improved technologies of seed, weedicides and plant protection measures, absence of assured marketing of remunerative price and insurance policy facility, lack of operational skill in the plant protection equipments and sandy storm, high wind velocity and high temperature affect the growth of crop and productivity whereas, the farmer faced

another problems in unavailability of inputs at the time of peak season, lack of water policy decided by the government ,uncertainty in supply of canal water and inputs are costly lack of cooperative marketing system were main reason responsible for low adoption. The another important constraints least perceived by the farmers were labour charges are costly lack of appropriate agronomical practices and low yield potential of prevalent varieties.

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