

Adoption of Mungbean 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. The results indicated that majority of the marginal, small and large farmers belonged to low adoption category for the mungbean production technologies such as 'high yielding varieties', 'seed treatment', 'application of organic manure', 'application of nitrogenous fertilizers', 'application of phosphatic fertilizers' and 'plant protection measures'. Medium level of adoption is found for the practices such as 'time of sowing' and 'interculture and weeding' while high adoption is noticed for the practices such as 'seed rate', 'method of sowing' and 'spacing'. The variables like caste, education, social participation, mass media exposure, contact with extension agencies and infrastructure facilities had positive and significant relationship while age had negative and significant correlation with adoption of mungbean production technology.

Key words: Adoption; High yielding varieties; Plant protection measures; Seed treatment;

Pulses are grown in about 32.07 lakh ha area in Rajasthan of which 21.33 lakh ha area comes under *kharif* pulses and 10.74 lakh ha areas under *rabi* pulses. Among the *kharif* pulses, mungbean is an important crop. It is grown about 7.59 lakh ha area with total production 2.71 lakh tones. It occupies 23.66 per cent of total pulses area and contributing 18.32 per cent of total production. Mostly, it is grown under rainfed condition. The average productivity of mungbean is 357 kg ha⁻¹ in the state (2006-07), which is low as compared to other mungbean growing states. The reasons for low productivity may be traditional methods of cultivation practiced by the farmers. With the development of high yielding varieties and better management practices, there is a much scope for further increase in yield. Therefore, the present study was undertaken to assess the extent of adoption of mungbean production technology by the farmers and to find out the relationship between socio-economic characteristic and adoption of mungbean production technology.

METHODOLOGY

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

district, two panchayat samities namely Mandore and Bhopalgarh of Jodhpur and Bhopalgarh Tehsils were randomly selected. 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 was within 0 to 3 km distance from the panchayat samiti. Second category was 3 to 6 km distance from the panchayat samiti and third category was 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 groups viz., marginal (upto 3.5 hectares unirrigated), small (3.51 to 7.0 hectares unirrigated) and large (more than 7 hectares unirrigated) with the help of Lekhpal and Village Development Officer 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 farmers. Total number of 180 respondents formed the sample of the study. The data on extent of adoption were collected using pre-tested structured schedule by personal interview

method. The extent of adoption of 11 important cultivation practices i.e. high yielding varieties, seed rate, seed treatment, time of sowing, method of sowing, spacing, application of organic manure, application of nitrogenous fertilizers, application of phosphatic fertilizers, interculture and weeding and plant protection measures were considered for the study.

RESULTS AND DISCUSSION

Practice wise extent of adoption of mungbean production technology: The respondents were categorized as low (up to 33.33 %), medium (33.34 to 66.66 %) and high adoption (above 66.66 %) categories depending upon their responses. Practice wise extent of adoption of mungbean production technology is described below.

High yielding varieties: The data presented in Table 1 revealed that majority of the marginal farmers (63.3 %) fall in low adoption category followed by high (26.7 %) and medium adoption category (10.0 %). It was found that 61.7, 5.0 and 33.3 per cent small farmers

belonged to low, medium and high adoption category, respectively. In case of large farmers, 55.0 per cent farmers belonged to low adoption category, 6.7 per cent medium and 38.3 per cent belonged to high adoption category. Similar findings also reported by *Singh (2003)*, *Singh (2004)* and *Singh and Chauhan (2006)*. Low adoption might be due to the non-availability of seed of high yielding varieties, lack of knowledge, lack of technical guidance and high cost of seed.

Seed rate: It was found that 41.7 per cent marginal farmers belonged to medium adoption category and 58.3 per cent belonged to high adoption category. In case of small and large farmers, majority of the farmers (55.0 and 66.7 %) belonged to high adoption category. About 45.0 per cent small farmers and 33.3 per cent large farmers belonged to medium adoption category.

Seed treatment: Majority of the marginal farmers (98.3 %) belonged to low adoption category. Both small and large farmers (96.7 % each) belonged to low adoption category. The above findings are in conformity with the

Table: 1 Extent of adoption of mungbean production technology

| S. No. | Practices | Extent of adoption | | | | | | | | |
|--------|--|--------------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|
| | | Marginal farmers | | | Small farmers | | | Large farmers | | |
| | | Low | Medium | High | Low | Medium | High | Low | Medium | High |
| 1. | High yielding varieties | 38 (63.3) | 6 (10.0) | 16 (26.7) | 37 (61.7) | 3 (5.0) | 20 (33.3) | 33 (55.0) | 4 (6.7) | 23 (38.3) |
| 2. | Seed rate | - | 25 (41.7) | 35 (58.3) | - | 27 (45.0) | 33 (55.0) | - | 20 (33.3) | 40 (66.7) |
| 3. | Seed treatment | 59 (98.3) | 1 (1.7) | - | 58 (96.7) | 1 (1.7) | 1 (1.6) | 58 (96.7) | 2 (3.3) | - |
| 4. | Time of sowing | 7 (11.7) | 33 (55.0) | 20 (33.3) | 5 (8.3) | 24 (40.0) | 31 (51.7) | 2 (3.3) | 31 (51.7) | 27 (45.0) |
| 5. | Method of sowing | 5 (8.3) | 11 (18.3) | 44 (73.4) | - | 14 (23.3) | 46 (76.7) | - | 10 (16.7) | 50 (83.3) |
| 6. | Spacing | - | 4 (6.7) | 56 (93.3) | - | 1 (1.7) | 59 (98.3) | - | 2 (3.3) | 58 (96.7) |
| 7. | Application of organic manure | 32 (53.3) | 24 (40.0) | 4 (6.7) | 19 (31.7) | 38 (63.3) | 3 (5.0) | 40 (66.7) | 18 (30.0) | 2 (3.3) |
| 8. | Application of nitrogenous fertilizers | 55 (91.7) | 3 (5.0) | 2 (3.3) | 53 (88.3) | 6 (10.0) | 1 (1.7) | 53 (88.3) | 6 (10.00) | 1 (1.7) |
| 9. | Application of phosphatic fertilizers | 57 (95.0) | 3 (5.0) | - | 56 (93.3) | 4 (6.7) | - | 54 (90.0) | 5 (8.3) | 1 (1.7) |
| 10. | Interculture and weeding | 5 (8.3) | 36 (60.0) | 19 (31.7) | 2 (3.3) | 32 (53.4) | 26 (43.3) | 4 (6.6) | 43 (71.7) | 13 (21.7) |
| 11. | Plant protection measures | 57 (95.0) | 3 (5.0) | - | 56 (93.3) | 3 (5.0) | 1 (1.7) | 55 (91.7) | 4 (6.7) | 1 (1.6) |

(Figures in parenthesis indicates the percentage of the respondents)

findings of *Singh (2003)*, *Singh (2004)* and *Singh and Chauhan (2006)*. Possible reason for low adoption may be lack of knowledge, technical guidance and high cost of fungicides.

Time of sowing: Table 1 shows that 55.0 per cent marginal farmers were in medium adoption category followed by high (33.3 %) and low adoption category (11.7 %). Among the small farmers, 8.3, 40.0 and 51.7 per cent farmers were in low, medium and high adoption category, respectively. In case of large farmers, 3.3 per cent were in low adoption category, 51.7 per cent in medium and 45.0 per cent were in high adoption category. The reason might be lack of moisture in the field, lack of sowing implements and non-availability of seed in time.

Method of sowing: It is evident that 8.3, 18.3 and 73.4 per cent marginal farmers belonged to low, medium and high adoption category, respectively. In case of small and large farmers, majority of the farmers (76.7 and 83.3 %) belonged to high adoption category and rest of the farmers (23.3 and 16.7 %) belonged to medium adoption category.

Spacing: Majority of the marginal, small and large farmers (93.3, 98.3 and 96.7 %) belonged to high adoption category. Only 6.7 per cent marginal farmers, 1.7 per cent small farmers and 3.3 per cent large farmers belonged to medium adoption category.

Application of organic manure: A perusal of Table 1 reveals that 53.3 per cent marginal farmers were in low adoption category followed by medium (40.0 %) and high adoption category (6.7 %). Among the small farmers, 31.7 per cent were in low adoption category, 63.3 per cent in medium and 5.0 per cent were in high adoption category. In case of large farmers, 66.7, 30.0 and 3.3 per cent farmers were in low, medium and high adoption category respectively. Low adoption might be due to lack of availability of organic manure and lack of finance.

Application of nitrogenous fertilizers: As high as 91.7 per cent marginal farmers belonged to low adoption category, 5.0 per cent medium and 3.3 per cent belonged to high adoption category. In case of small and large farmers, majority of the farmers (88.3 % each) belonged to low adoption category, followed by medium (10.0 % each) and high adoption category (1.7 % each). Similar findings also reported by *Singh (2003)*, *Singh (2004)*

and *Singh and Chauhan (2006)*. It might be due to lack of irrigation facilities, lack of knowledge, high cost of fertilizers and non-availability of credit.

Application of phosphatic fertilizers: Table 1 indicated that 95.0 per cent marginal farmers were in low adoption category and rest 5.0 per cent were in medium adoption category. Among the small farmers 93.3 per cent and 6.7 per cent farmers were in low and medium adoption category respectively. In case of large farmers, majority of the farmers (90.0 %) were in low adoption category, 8.3 per cent medium and only 1.7 per cent were in high adoption category. *Acharya and Gupta (1982)* reported that only 4.9 per cent of the farmers applied phosphatic fertilizers to the pulses. *Singh (2003)*, *Singh (2004)* and *Singh and Chauhan (2006)* also reported majority of the farmers belonged to low adoption category. Low adoption might be due to lack of irrigation facilities, lack of knowledge, high cost of fertilizers and non-availability of credit.

Intercultural and weeding: It is evident that 8.3 per cent marginal farmers belonged to low adoption category, 60.0 per cent medium and 31.7 per cent belonged to high adoption category. Among the small farmers, 3.3, 53.4 and 43.3 per cent farmers belonged to low, medium and high adoption category respectively. In case of large farmers, 71.7 per cent farmers belonged to medium adoption category followed by high (21.7 %) and low adoption category (6.6 %). The probable reason might be shortage of labour, lack of time and lack of advice.

Plant protection measures: 95.0 per cent marginal farmers were in low adoption category and rest 5.0 per cent were in medium adoption category. Among the small farmers, 93.3, 5.0 and 1.7 per cent farmers were in low, medium and high adoption category respectively. In case of large farmers, majority of the farmers (91.7 %) were in low adoption category, 6.7 per cent in medium and 1.6 per cent were in high adoption category. Similar findings also reported by *Singh (2003)*, *Singh (2004)* and *Singh and Chauhan (2006)*. The reason may be due to lack of knowledge, lack of technical guidance, high cost of plant protection chemicals, non-availability of plant protection chemicals and lack of finance.

Overall adoption of mungbean production technology : The data presented in Table 2 indicated

Table 2 Distribution of respondents according to their overall adoption of mungbean production technology

| S. No. | Adoption | Type of farmers | | | | | | | |
|--------|------------------------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|
| | | Marginal | | Small | | Large | | Total | |
| | | N | % age | N | % age | N | % age | N | % age |
| 1. | Low adoption (Up to 33.33 %) | 15 | 25.0 | 10 | 16.7 | 12 | 20.0 | 37 | 20.5 |
| 2. | Medium adoption (33.34 to 66.66 %) | 42 | 70.0 | 46 | 76.7 | 45 | 75.0 | 133 | 73.9 |
| 3. | High adoption (Above 66.66 %) | 3 | 5.0 | 4 | 6.6 | 3 | 5.0 | 10 | 5.6 |
| | Total | 60 | 100.0 | 60 | 100.0 | 60 | 100.0 | 180 | 100.0 |

that overall majority of the farmers (73.9 %) had medium adoption followed by low (20.5 %) and high adoption (5.6 %). Among the marginal farmers, 70.0 per cent had medium adoption of mungbean production technology. However, 25.0 per cent farmers had low adoption and 5.0 per cent high adoption. In case of small farmers, 16.7, 76.7 and 6.6 per cent farmers had low, medium and high adoption respectively. It was noticed that majority of the large farmers (75.0 %) had medium adoption, 20.0 per cent low and 5.0 per cent had high adoption of mungbean production technology. These findings are in conformity with the findings of *Nikhade et al. (1992)*, *Methi and Hachinal (1994)*, *Bhople and Akolkar (1994)*, *Agarwal et al. (1997)* and *Sujatha and Annamalai (1998)*, *Manhas et al. (2003)*, *Singh (2003)* and *Singh (2004)*.

Relationship between socio-economic characteristics and adoption of mungbean production technology:

It is evident from Table 3, that age of the marginal, small and large farmers was negatively and significantly

correlated with adoption, which implies that young farmers were using improved practices more as compared to old farmers. The possible reason might be due to their better education, great enthusiasm and more mass media exposure. The above finding is in conformity with the findings of *Gogoi and Gogoi (1989)*, *Singh (2003)* and *Singh and Chauhan (2006)*.

Caste of marginal, small and large farmers was positively and significantly correlated with adoption. This indicates that lower castes including Scheduled caste and scheduled tribes were low adopters of improved technology. The finding is supported by *Saxena et al. (1990)* and *Singh and Chauhan (2006)*.

Education, social participation, mass media exposure and contact with extension agencies and infrastructure facilities of all the three categories of farmers were positively and significantly correlated with adoption. *Jat (1991)* and *Singh and Chauhan (2006)* found education; social participation, mass media exposure and contact with extension agencies had

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

| S. No. | Socio-economic characteristics | Correlation coefficient(r) | | |
|--------|---------------------------------|-----------------------------|---------------|---------------|
| | | Marginal farmers | Small farmers | Large farmers |
| 1. | Age | -0.3506** | -0.3227* | -0.2821* |
| 2. | Caste | 0.4526** | 0.3094* | 0.2650* |
| 3. | Education | 0.7917** | 0.8916** | 0.7150** |
| 4. | Family type | -0.1760 | -0.2003 | -0.2201 |
| 5. | Family size | -0.2060 | -0.2370 | -0.1982 |
| 6. | Size of holding | 0.1476 | -0.1586 | 0.2086 |
| 7. | Occupation | 0.1553 | 0.0450 | 0.0376 |
| 8. | Per capita annual income | 0.0998 | 0.1256 | 0.2374 |
| 9. | Social participation | 0.4234** | 0.4209** | 0.6317** |
| 10. | Mass media exposure | 0.7683** | 0.8055** | 0.6838** |
| 11. | Contact with extension agencies | 0.7469** | 0.7712** | 0.7514** |
| 12. | Infrastructure facilities | 0.6770** | 0.7078** | 0.6436** |

* = Significant at 0.05 level of significance

** = Significant at 0.01 level of significance

positive and significant relationship with adoption of 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. *Singh (2003) and Singh (2004)* found that education and extension contact had positive and significant relationship with adoption. Family type, family size, size of holding, occupation and per capita annual income of marginal, small and large farmers were non-significant correlated with adoption. This clearly showed that these variables did not have any impact on adoption.

CONCLUSION

From the findings, it can be concluded that 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 organic manure', 'application of nitrogenous-fertilizers', 'application of phosphatic fertilizers' and 'plant protection measures', medium adoption for the practices such as 'time of sowing' and 'interculture and weeding' and high adoption for the practices such as 'seed rate', 'method of sowing' and 'spacing' of mung bean production technology. The variables like caste, education, social participation, mass media exposure, contact with extension agencies and infrastructure facilities had positive and significant relationship while age had negative and significant correlation with adoption of mung bean production technology. The study suggests that the practices 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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