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Constraints perceived by the farmers in adoption of recommended soybean cultivation practices

Surendra Kumar and NK Sharma

Abstract

The present investigation was conducted in Kota region of Rajasthan purposively because this region stands first in area 822329 hectare and production 1197758 tonnes of soybean cultivation among all ten agriculture regions of Rajasthan. Kota region comprises four districts viz., Kota, Baran, Bundi and Jhalawar. Out of these two districts viz., Kota and Jhalawar were selected purposively for this study because of highest area and production. List of all the soybean cultivators was prepared from each of the selected village, with the help of patwari and agriculture supervisor, eight to twelve farmers were selected by using proportionate random sampling technique as per availability so as to make the sample size 220. The independent variables like age, education, and size of land holding were found to be positive and significantly associated with the knowledge level of farmers about recommended soybean cultivation practices at Significant at 0.01 per cent level of significance. While, the variables like extension participation were found to be positive and significantly associated with the knowledge level of farmers about recommended soybean cultivation practices at Significant at 0.05 per cent level of significance, whereas caste, family type and family size were found to be non-significantly associated with the knowledge level of farmers about recommended soybean cultivation practices.

Keywords: Level of attitude, mean per cent score and recommended soybean cultivation practices

Introduction

Soybean [*Glycine max* (L.) Merrill] belongs to family leguminosae, sub family papilionaceae and genus glycine. It is mainly grown in kharif season. Soybean is reported to have originated in eastern Asia or China and has been to man over 5000 years. It was introduced in USA in the year 1804 and has since revolutionized the agriculture of that country. In India efforts have been made since 1969 to popularize its cultivation and consumption. Soybean has been known by various names in India such as Bhat, Bhatman, Ramkuithi etc. It is called the miracle crop of the twentieth century and is popularly known as "queen of pulses," wonder crop, farmers friend and agriculture's Cinderella. It is the cheapest source of high quality protein. It contains 20 per cent oil and 40 per cent high quality protein. Its oil is used for manufacturing vanaspati ghee and several other industrial products. Therefore, keeping this in view, the present study was under taken with objectives: To find out the association between level of attitude of recommended soybean cultivation practices by the farmers and their selected independent variables.

Research Methodology

To find out the constraints that hinder the adoption of recommended soybean cultivation practices, a separate schedule was prepared for study. All possible constraints were included in the schedule in accordance with the recommended soybean cultivation practices. The responses obtained from respondents were recorded on a three point continuum scale viz., most important, important and least important and were assigned 3, 2 and 1 score respectively (Appendix-V).

1. Low level constraint - < Mean - standard deviation
2. Medium level constraints - Mean - standard deviation to mean + standard deviation
3. High level constraints - > Mean + standard deviation

Frequency and percentage of farmers in each category were calculated. Further, to determine the intensity of constraints, mean per cent score for each item was worked out and ranked, accordingly. Besides to find out the significance of difference among group of farmers with

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respect to constraints encountered by them conclusions were drawn, accordingly.

Results and Discussion

1. Constraints perceived by the farmers in adoption of recommended soybean cultivation practices

In this section, it was tried to find out the constraints in the adoption/use of recommended soybean cultivation practices perceived by the farmers. To get an over view of level of constraints faced by the farmers in adoption of recommended soybean cultivation practices were grouped into three categories i.e. low level constraints, medium level constraints and high level constraints on the basis of calculated mean and standard deviation of the obtained constraints scores by the respondents.

The respondents were grouped in to three categories, using mean (51.44) \pm standard deviation (3.46) which are as follows:-

- Respondents who scored below 47.98 (Mean – standard deviation) were grouped under low level of constraints
- The respondents who scored from 47.99 to 54.90 (Mean – standard deviation to Mean + standard deviation) were considered under medium level of constraints
- Those respondents who obtained score above 54.90 (Mean + standard deviation) were categorized under high level of constraints.

The data given in Table 1 reveal that majority of the farmers (57.74 per cent) were found to have medium constraint level in adoption of recommended soybean cultivation practices whereas 24.54 per cent and 17.72 per cent of farmers were having high and low constraint level, respectively. The results regarding constraint level of farmers in adoption of recommended soybean cultivation practices were also presented diagrammatically.

Table 1: Levels of constraints faced by farmers in adoption of recommended soybean cultivation practices N= 220

S. No.	Constraint categories	Frequency	Percentage
1.	Low (scores below 47.98)	39	17.72
2.	Medium (scores between 47.99 to 54.90)	127	57.74
3.	High (scores above 54.90)	54	24.54
	Total	220	100.00

$$\bar{X} = 51.44, \sigma = 3.46$$

All the possible constraints faced by the respondents which hinder the adoption/use of improved practices of soybean were grouped in to eleven major categories viz., “High yielding varieties”, “Field preparation and soil treatment”, “Seed treatment”, “Seed Rate and Time of Sowing”, “Fertilizer application”, “Irrigation Management”, “Weed Management”, “Plant Protection Measures”, “Harvesting Threshing and Storage”, “Natural Calamities”, and last “Economic constraints”.

The mean per cent score was calculated and ranked according to obtained MPS by that particular constraint.

2. Constraints related to high yielding varieties

The data given in Table 2 reveal that “Unavailability of improved HYVs seed are at the time of sowing (68.33 MPS)”, was perceived as the biggest constraint with high intensity faced by respondents indicated by first rank assigned to it. This was followed by “HYVs seeds are costly (58.60)”, “HYVs require more fertilizer for their response (48.18)”, “Lack of knowledge about HYVs (39.54)”, with II, III, and

IV, ranks assigned in order of HYVs constraints realized by overall respondents, respectively. This might be due the fact that number of VEVs and KVK scientists are inadequate. The working area of a VEV and KVK scientist was more. Therefore, it was not possible to cover entire farm families in their operational area and the higher cost of hybrid seeds. The result regarding high yielding varieties related constraints faced by farmers in recommended soybean cultivation practices.

Table 2: High yielding varieties related constraints perceived by the farmers N=220 (Multiple response)

S. No	Constraints	MPS	Rank
1.	Unavailability of improved HYVs seeds are at the time of sowing	68.33	I
2.	Lack of knowledge about HYVs	39.54	IV
3.	HYVs require more fertilizer for their response	48.18	III
4.	HYVs seeds are costly	58.60	II

The findings of the study draw support from the finding of Kumawar (2015)^[4].

3. Constraints related to field preparation and soil treatment

The data given in Table 3 show that “Lack of technical knowledge of field preparation”, was most important constraint with 43.18 MPS faced by respondents and it was ranked first. Whereas, “High cost of field preparation”, “Unavailability of chemicals for soil treatment and higher cost of chemicals for seed treatment”, secured 40.90, and 37.42 MPS and ranked second, third, respectively. It might be due to the monopoly of private dealers and traders that they sell seeds on high cost with low quality to farmers in the rural area. This was also true that the problems of credit facility and services provided by Banks were not timely and delay in credit dispersal was there, So, farmers could not use proper improved techniques in the field. The result regarding constraints related to field preparation and soil treatment faced by farmers in recommended soybean cultivation practices.

Table 3: Field preparation and soil treatment related constraints perceived by the farmers N=220

S. No.	Constraints	MPS	Rank
1.	Lack of technical knowledge of field preparation	43.18	I
2.	High cost of field preparation	40.90	II
3.	Unavailability of chemicals for soil treatment and high cost of chemicals for soil treatment	37.42	III

The findings of the study draw support from the finding of Geenger (2006) and Singh *et al.* (2009).

4. Seed treatment related constraints perceived by the farmers

The data given in Table 4 show that “Lack of knowledge and skill for seed treatment”, was most important constraint with 59.09 MPS faced by respondents and it was ranked first. Whereas, Farmers are non-convinced about the importance of seed treatment”, “Unavailability of recommended chemicals for seed treatment”, secured 55.57, and 51.72 MPS and ranked second and third, respectively. It might be due to the reason that most of farmers were illiterate and also no proper guidance received from agriculture supervisor. So, farmers could not use proper improved techniques in the field.

Table 4: Seed treatment related constraints perceived by the farmers N=220

S. No.	Constraints	MPS	Rank
1.	Lack of knowledge and skill for seed treatment	59.09	I
2.	Unavailability of recommended chemicals for seed treatments	51.72	III
3.	Farmers are not convinced about the importance of seed treatment	55.57	II

5. Seed Rate and Time of Sowing related constraints perceived by the farmers

The data given in Table 5 show that “Lack of knowledge about recommended seed rate”, was most important constraint with 37.87 MPS faced by respondents and it was ranked first. Whereas “Lack of knowledge about time of sowing”, secured 36.06 MPS and was rank second. It might be due to the fact that the farmers have less contact with VEWs and other extension personnel. The result regarding constraints related to “Seed rate and Time of sowing”, faced by farmers in adoption of recommended soybean cultivation practices.

Table 5: Seed rate and time of sowing related constraints perceived by the farmers N=220

S. No	Constraints	MPS	Rank
1.	Lack of knowledge about recommended seed rate	37.87	I
2.	Lack of knowledge about time of sowing	36.06	II

6. Fertilizer application related constraints perceived by the farmers

The data given in Table 6 show that “Unavailability of fertilizers at the peak season (66.36 MPS)”, was perceived as major constraint by the respondents which was assigned first rank. This was followed by the other constraints like “Reduction of soil fertility with use of chemical fertilizer (56.96 MPS)”, “Lack know how about use of micronutrient in soybean cultivation (53.30 MPS)”, “Lack of knowledge about recommended doses of fertilizers (46.21 MPS)”, “Unavailability of FYM (45.77 MPS)”, which were accorded II, III, IV and V ranks in order of fertilizer application related constraints perceived by the farmers. It was reported by respondents that the cooperative societies had become most defunct. Due to this, they could not get the required inputs and equipments timely. The results regarding fertilizer application related constraints faced by farmers in adoption of recommended soybean cultivation practices.

Table 6: Fertilizer application related constraints perceived by the farmers N=220

S. No	Constraints	MPS	Rank
1.	Unavailability of fertilizers at the peak season	66.36	I
2.	Lack of knowledge about recommended doses of fertilizers	46.21	IV
3.	Unavailability of FYM	45.77	V
4.	Detoriation of soil health by continuous imbalanced use of chemicals and fertilizers	56.96	II
5.	Lack know how about use of micronutrients in soybean cultivation	53.30	III

7 Irrigation Management related constraints perceived by the farmers

The data given in Table 7 show that “Timely unavailability of electricity and higher cost of diesel (77.66 MPS)”, was

perceived as major constraint by the respondents and was which assigned first rank. This was followed by the other constraints like “Lack of knowledge about quantity and methods of water application (50.41 MPS)”, “Lack of knowledge about critical stage of irrigation in soybean crop (34.84 MPS)”, and “Lack of irrigation water (32.12 MPS)”, were reported at II, III and IV ranks in order of irrigation management constraints perceived by the farmers. It might be due to electricity not available timely, lower knowledge of farmers about irrigation management, lower precipitation, of uncertain frequency, duration and severity, the occurrence of which is difficult to predict, resulting in diminished water resources availability and carrying capacity of the ecosystems. The results regarding Irrigation Management constrains faced by farmers in adoption of recommended soybean cultivation practices.

The findings of the study draw support from the finding of Sharma *et al.* (2005) [8], Suthar *et al.* (2010) [9], and Kumawat (2015) [4].

Table 7: Irrigation Management related constraints perceived by the farmers N=220

S. No	Constraints	MPS	Rank
1.	Lack of knowledge about critical stage of irrigation in soybean crop	34.84	III
2.	Lack of irrigation water	32.12	IV
3.	Lack of knowledge about quantity and methods of water application	50.41	II
4.	Timely unavailability of electricity and higher cost of diesel	77.66	I

8. Weed Management related constraints perceived by the farmers

The data given in Table 8 indicate that “Higher cost of herbicide (70.09 MPS)”, was perceived as major constraint by the farmers and was assigned first rank. This was followed by the other constraints like “Unavailability of labour (55.61MPS)”, “Unavailability of herbicides for weed management (41.19 MPS)”, and “Lack Lack of knowledge about weed management practices (35.85 MPS)”, which were accorded II, III and IV ranks in order of weed management constraints perceived by the farmers. This might be due to the fact that the number of VEWs for crops was still inadequate. The operational area of a VEW was large. Therefore, it was not possible to cover the entire farmers in that area. Most of the respondents do not use weedicides because weedicides some time affect the main crop also. Because of this reason, they have followed hand weeding practice and used these weeds as green fodder for the animals. The results regarding weed Management constrains faced by farmers in adoption of recommended soybean cultivation practices.

Table 8: Weed Management related constraints perceived by the farmers N=220

S. No	Constraints	MPS	Rank
1.	Lack of knowledge about weed management practices	35.85	IV
2.	Unavailability of labour	55.61	II
3.	Unavailability of herbicides for weed management	41.19	III
4.	Higher cost of herbicide	70.09	I

9. Plant Protection Measures related constraints perceived by the farmers

The data given in Table 9 indicate that “High cost of plant protection chemicals (65.33 MPS)”, was perceived as major

constraint by the farmers and was assigned first rank. This was followed by the other constraints like “Unavailability of plant protection chemicals in the local market (56.30 MPS)”, and “Lack of knowledge about plant protection measures (44.52)”, which were accorded II and III ranks in order of plant protection measures related constraints perceived by the farmers. It might be due to the monopoly of private dealers and traders that they sell insecticides and pesticides on high cost with low quality to farmers in the rural area. This was also true that the problems of credit facility and services provide by Banks are not timely and delay in credit dispersal was reported So, farmers could not use proper improved techniques in the field. The results regarding plant protection measures related constraints faced by farmers in adoption of recommended soybean cultivation practices.

Table 9: Plant Protection Measures related constraints perceived by the farmers N=220

S. No.	Constraints	MPS	Rank
1.	Lack of knowledge about plant protection measures	44.52	III
2.	High cost of plant protection chemicals	65.33	I
3.	Unavailability of plant protection chemicals in the local market	56.30	II

10. Harvesting, Threshing and Storage related constraints perceived by the farmers

The data given in Table 10 indicate that “Lack of warehouse facility (68.66 MPS)”, was perceived as the major constraint and was assigned first rank by the respondents. This was followed by the other constraints like “Unavailability of labour at the time of harvesting (66.50 MPS)”, “Problem of grazing animals (48.77 MPS)”, and “Lack of technical know how (42.36 MPS)”, which were given II, III, and IV, ranks in order of Constraints related to harvesting, threshing and storage. The results regarding constraints related to harvesting, threshing and storage faced by farmers in adoption of recommended soybean cultivation practices.

The findings of the study draw support from the finding of Asiwal (2006)^[3], Prasad (2011), and Kumawat (2015)^[4].

Table 10: Harvesting Threshing and Storage related constraints perceived by the farmers N=220

S. No	Constraints	MPS	Rank
1.	Lack of technical know how	42.36	IV
2.	Unavailability of labour at the time of harvesting	66.50	II
3.	Problem of grazing animals	48.77	III
4.	Lack of warehouse facility	68.66	I

11. Natural Calamities related constraints perceived by the farmers

The data given in Table 11 indicate that “Rainfall at the time of sowing (72.66 MPS)” was perceived as the major constraint and was assigned first rank by the respondents. This was followed by the other constraint like “Cloudy weather and heavy rainfall at the time of flowering (56.80 MPS)” which was accorded II rank in order of constraints related to “Natural calamities”. The results regarding constraints related to “Natural calamities” faced by farmers in adoption of recommended soybean cultivation practices.

The findings of the study draw support from the finding of Prasad (2011).

Table 11: Natural Calamities related constraints perceived by the farmers N=220

S. No	Constraints	MPS	Rank
1.	Cloudy weather and heavy rainfall at the time of flowering	56.80	II
2.	Rainfall at the time of sowing	72.66	I

12. Economic Constraints perceived by the farmers

The data given in Table12 indicate that “High cost of inputs for cultivation (73.33 MPS)” was perceived as the major constraint and was assigned first rank by the respondents. This was followed by the other constraints “Low price of product at the time of harvesting (65.44 MPS)”, “Lack of assured purchasing on MSP (56.66 MPS)”, “Unavailability of credit at normal interest rate (47.50 MPS)”, “Monopoly of traders in the mandies (44.72 MPS)” and “Absence of assured remunerative price in the market (44.30 MPS)” which were accorded II, III, IV, V and VI, ranks in order of economic constraints. Lack of credit facilities for higher input costs and banks are not in most of the sample villages. So farmers are forced to purchase input from local markets and take credit from local money lenders. The results regarding economic constraints faced by farmers in adoption of recommended soybean cultivation practices.

The findings of the study draw support from the finding of Asiwal (2006)^[3], Nagar (2006)^[6] and Prasad (2011).

Table 12: Economic Constraints related constraints perceived by the farmers N=220

S. No	Constraints	MPS	Rank
1.	High cost of inputs for cultivation	73.33	I
2.	Unavailability of credit at normal interest rate	47.50	IV
3.	Lack of assured purchasing on MSP	56.66	III
4.	Monopoly of traders in the mandies	44.72	V
5.	Low price of product at the time of harvesting	65.44	II
6.	Absence of assured remunerative price in the market	44.30	VI

13. Overall constraints perceived by the farmers in adoption of recommended soybean cultivation practices

The data in Table 13 reveal that among the eleven categories of constraints “High yielding varieties”, “Field preparation and soil treatment”, “Seed treatment”, “Seed Rate and Time of Sowing”, “Fertilizer application”, “Irrigation Management”, “Weed Management,” “Plant Protection Measures”, “Harvesting Threshing and Storage”, “Natural Calamities”, and last “Economic Constraints were perceived to least extent by respondents. Out of which “Natural Calamities” were of highest intensity, followed by “Harvesting Threshing and Storage”, “Seed treatment” “Plant Protection Measures”, “Economic Constraints”, “Fertilizer application”, “High yielding varieties”, “Weed Management”, “Irrigation Management”, “Field preparation and soil treatment”, and “Seed Rate and Time of Sowing”, constraints were perceived least by respondents.

Table 13: Overall constraints perceived by the farmers in adoption of recommended soybean cultivation practices N=220

S. No	Constraints	MPS	Rank
1.	High yielding varieties	53.66	VII
2.	Field preparation and soil treatment	40.50	X
3.	Seed treatment	55.46	III
4.	Seed Rate and Time of Sowing	36.96	XI
5.	Fertilizer application	53.72	VI
6	Irrigation Management	48.75	IX
7	Weed Management	50.68	VIII
8	Plant Protection Measures	55.38	IV
9	Harvesting Threshing And Storage	56.57	II
10	Natural Calamities	64.73	I
11	Economic Constraints	55.32	V

Conclusion

Among the eleven constraints the constraint related to “Natural Calamities”, was the major constraint perceived by the soybean growers. This constraint was followed by constraints related to “Harvesting threshing and storage”, “Seed treatment”, “Plant Protection Measures”, “Economic Constraints”, Fertilizer application, “High yielding varieties”, “Weed Management”, “Irrigation Management”. Least perceived constraints were “Field preparation and soil treatment, “Seed Rate and Time of Sowing”. The overall constraints faced by the respondents were 51.97 MPS.

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