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An evaluation study of the improved varieties of soybean adopted by the farmers

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Abstract
The present investigation was conducted in sehore district of M.P with an aim to identify the level of adoption of improved soybean varieties by the soybean growers and association between the profile characteristics of soybean growers with their adoption of improved soybean varieties. For this 130 soybean growers were selected as a respondents through proportionate random sampling method. The major findings of the study showed that out of total respondents, 48.45 per cent had medium adoption level, followed by 33.85 per cent had low and only 17.70 per cent had low adoption level of improved variety of soybean.

Keywords: Level of adoption, improved varieties, soybean growers

Introduction
Soybean (*Glycine max* L. Merrill) has become the miracle crop of the 21st century. It is the single largest oil production crop in the world with the total oil production of 310-320 million tonnes annually. This crop has very large potential among grain legume crops for hostility acute malnutrition as it provides high quality protein (40% to 42%), 20% cholesterol free oil and 30% carbohydrate. it is also a good source of dietary fibre, calcium, magnesium, phosphate, thiamine, riboflavin and niacin. Soybean has been reported to have therapeutic properties in combating diabetes, cancer, heart disease. It is the number one oilseed crop in India and has become an important oilseed crop in India in a very short period with approximately 10-million ha area under its cultivation.

In India Madhya Pradesh state is known as "Golden State or Soya State" because of highest area sown in soybean as compared to other states in India. The total area under soybean in M.P. is 54.010 thousand hectares with the production of 4517.30 thousand tonnes and average yield is 733 kg/ha (M.P. Govt. in 2013-14). In context with Sehore district of M.P, soybean is a prominent kharif crop, occupying 53.8 thousand hectare area with 8.88 mt production and 1429kg/ha productivity. (Source: Department of Agriculture, Sehore M.P. 2015-16).

During the past few years, soybean cultivation in the state is facing number of constraints due to which production is decreasing day by day because over the years, the rural farmers are dependent on indigenous or local variety for production and these varieties are low yielding, biotic and abiotic stresses susceptible, bacterial diseases susceptible and late maturing. To solve these problems, governmental and non-governmental bodies have made different efforts to bring change in production and productivity of soybean. They have introduced improved agricultural technologies like use of fertilizers, high yielding varieties, improved farm implements, etc. which improves the production and productivity of the crop. However, the introduced technologies were not widely accepted by farmers in different parts of the country as expected (FAO, 2010) [1].

Methodology
The present study was carried out in Sehore district of Madhya Pradesh. Sehore district comprises 5 blocks, out of which Sehore Block was selected purposively, due to having maximum area under soybean crop. Sehore block consist of 157 Village Panchayat. Out of which ten villages were selected on the basis of highest area coverage under soybean crop. As per the list provided by RAEO and other officials of farmers of each selected villages, who were growing soybean as a major crop, from this list of the registered farmers, respondents were selected from each village through proportionate sampling method to make a sample of 130 farmers. The data were collected through well- structured ,personal interview schedule The collected data were coded, quantified, classified, tabulated and analysed with the help of frequency, percentage and χ^2 test respectively.

Result and Discussion

I. Profile characteristics of soybean growers

The data in Table 1 represents the profile characteristics of soybean growers. As far as socio-economic and personal profile of soybean growers is considered the results shows that higher percentage of soybean growers were in the age category of 36 to 55 years (38.47%), educated up to middle school (33.07%), medium size of family (46.15%), medium size of land holding (36.92%), medium annual income (41.54%), medium level of social participation (42.30%), medium level of farming experience (40.00%). Further, regarding communicational characteristics table shows that majority of the respondents were having medium level of source of information (49.24%), medium level of extension contact (40.00%), medium mass media exposure (30.00%). As well as psychological characteristics table shows that majority of the respondents were having medium level of economic motivation (41.54%), medium risk orientation (40.77%) and low level of achievement motivation (39.23%).

Table 1: Profile characteristics of soybean growers N=130

S. N.	Categories		Frequency	Percentage
1	Age	Up to 35 years	37	28.46
		36 to 55 years	50	38.47
		Above 55 years	43	33.07
2	Education	Illiterate	20	15.39
		Up to Primary School	31	23.85
		Up to middle	43	33.07
		High school and above	36	27.69
3	Size of family	Small family (Score up to 4)	37	28.46
		Medium family (5-7)	60	46.15
		Large family (Above 7)	33	25.39
4	Size of land holding	Marginal (up to 1 ha)	26	20.00
		Small Farmers (1 to 2 ha)	22	16.92
		Medium Farmers (2.01 to 4 ha)	48	36.92
		Large farmers (above 4 ha)	34	26.16
5	Annual income	Low (Up to Rs. 50,000)	33	25.38
		Medium (50,001 to 70,000)	54	41.54
		High (Above Rs. 70,000)	43	33.08
6	Social participation	Low (Score up to 12)	45	34.62
		Medium (13-19)	55	42.30
		High (Above 19)	30	23.08
7	Farming experience	Low (Up to 3 years)	31	23.84
		Medium (3.1 to 5 years)	52	40.00
		High (Above 5 years)	47	36.16
8	Source of information	Low (Up to 11)	40	30.76
		Medium (12-17)	64	49.24
		High (Above 17)	26	20.00
9	Extension contact	Low (Up to 7)	33	25.38
		Medium (8-12)	58	44.62
		High (Above 12)	39	30.00
10	Mass media exposure	Low (Up to 7)	50	38.47
		Medium (8-9)	39	30.00
		High (Above 9)	41	31.53
11	Economic motivation	Low (Up to 18)	34	26.16
		Medium (19-30)	54	41.54
		High (Above 30)	42	32.30
12	Risk orientation	Low (Up to 15)	33	25.39
		Medium (16-20)	53	40.77
		High (Above 20)	44	33.84
13	Achievement motivation	Low (Up to 6)	51	39.23
		Medium (7-8)	32	24.61
		High (Above 8)	47	36.16

II. Adoption of improved varieties of soybean by the farmers.

Table 2: Mean score, rankand percentage of the selected soybean grower farmers and their adoption of improved variety of soybean. N=130

S. No.	Technological practices	Extent of Adoption			Total score	Mean score	Rank
		High	Medium	Low			
1	Early maturing variety	60 (46.15)	48 (36.92)	22 (16.92)	168	1.29	III
2	Medium maturing variety	46 (35.38)	51 (39.23)	33 (25.38)	143	1.10	IV
3	Late maturing variety	43 (33.07)	49 (37.69)	38 (29.23)	145	1.11	V
4	Insect and disease resistance variety	75 (57.69)	34 (26.15)	23 (17.69)	184	1.41	II
5	High yielding variety	82 (63.07)	28 (21.53)	20 (15.38)	192	1.47	I

The data present in table 2 describes the distribution of respondents as per their obtained mean score of adoption in the components of the soybean variety.

Regarding adoption of early maturing varieties showed, majority of the respondents 46.15 per cent pertained high level of adoption followed by medium adoption 36.92 per cent and low adoption 16.92 per cent respectively.

Found that the adoption of medium maturing varieties showed, majority of the respondents 39.25 per cent pertained medium level of adoption followed by high adoption 35.38 per cent and low adoption 25.38 per cent respectively.

Revealed that the adoption of late maturing varieties showed, majority of the respondents 37.69 per cent pertained medium level of adoption followed by high adoption 33.07 per cent and low adoption 29.23 per cent respectively. .

As far as adoption of insect and disease resistance varieties showed, majority of the respondents 57.69 per cent pertained high level of adoption followed by medium adoption 26.15 per cent and low adoption 17.69 per cent respectively.

Indicated that the adoption of high yielding varieties showed, majority of the respondents 63.07 per cent pertained high level of adoption followed by medium adoption 21.53 percent and low adoption 15.38 per cent respectively.

Table 2 it was also observed that the adoption rank was highest in improved variety high yielding varieties (I), insect and disease resistance varieties (II), early maturing varieties (III), medium maturing varieties (IV) and low adoption of late maturing varieties (V).

Table 3: Distribution of respondents according to their adoption level of improved variety of soybean N=130

S. No.	Adoption	No. of respondents	Percentage
1.	Low	44	33.85
2.	Medium	63	48.45
3.	High	23	17.70
Total		130	100.00

Table 3 shows that out of 130 respondents, 48.45per cent had medium adoption level, followed by 33.85 per cent had low and only 17.70per cent had low adoption level of improved variety of soybean. This finding is similar to findings of Sharma *et al.* (2005) [4] and Paikra (2008) [2].

III. Association between the profile characteristics of soybean growers with their adoption of improved soybean varieties.

Table 4: Association between profile characteristics of the respondents and their adoption of improved varieties of soybean N=130

S. N.	Characteristics	χ^2 value	C	Degree of association
1.	Age	7.25	0.11	Negligible
2.	Education	15.78	0.36	Fair
3.	Size of family	3.04	0.10	Negligible
4.	Size of land holding	16.74	0.36	Negligible
5.	Social participation	3.16	0.10	Negligible
6.	Annual income	9.87	0.31	Fair
7.	Farming experience	10.70	0.32	Fair
8.	Source of information	18.51	0.37	Fair
9.	Extension contact	15.40	0.36	Fair
10.	Mass media	9.99	0.31	Fair
11	Risk orientation	10.91	0.32	Fair
12.	Economic motivation	16.32	0.36	Fair
13.	Achievement motivation	9.94	0.31	Fair

(*non-significant at 0.05% level, ** significant at 0.05% level, C: Co-efficient of association)

A critical examination of the data present in the table 4 reveals that out of 13 variables, only nine variables i.e. education, annual income, farming experience, risk orientation, economic motivation, achievement motivation, mass media exposure, source of information and extension contactwere significantly associated and positively relatedwith adoption of improved varieties of soybean. Further, other four variables namely age, size of family, size of land holding and social participation of the farmers did not establish any significant association with their adoption of improved varieties of soybean.

Conclusion

The finding of the study shows that majority of respondents were in the age category of Middle age ,educated up to middle school, medium size of family, had medium size of land holding, medium annual income, medium level of social participation , medium level of farming experience, having

medium level of source of information, having medium level of extension contact, had medium mass media exposure, having medium level of economic motivation, medium level of risk orientation and low level of achievement motivation. It is also found that the majority of 48.45 per cent farmers had medium adoption level, followed by 33.85 per cent had low and only 17.70 per cent had low adoption level of improved variety of soybean. On the other hand association between profile characteristics of the respondents with their adoption of improved varieties of soybean namely, education, annual income, farming experience, risk orientation, economic motivation, achievement motivation, mass media exposure, source of information and extension contact were significant association with their adoption at 5% level of significance, whereas age, size of land holding , size of family and social participation of the farmers did not establish significant association with their adoption of improved varieties of soybean.

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