

Research  
Paper

## Correlation of knowledge of soybean cultivation practices

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### ABSTRACT

The present research study was conducted in 15 villages comprising of 5 villages each from Buldana, Chikhli and Mehkar Panchayat Samitis of Buldana District of Vidarbha region of Maharashtra State to ascertain the knowledge of recommended cultivation practices of soybean by the farmers. Majority of the respondents had a high level of knowledge of cultivation practices recommended for soybean. Recommended practices like preparatory tillage, method of sowing, sowing time, proper hoeing time, soil type, high yielding varieties, sowing depth and recommended intercropping requirement for soybean were known to most of the farmers. As regards the variation in the area under soybean crop almost all the farmer/ respondents shifted over soybean from cotton and jowar and cotton in particular. The findings of the relational analysis revealed that out of fourteen characteristics studied, eleven variables namely education, land holding, occupation, soil type, annual income, cropping pattern, experience in soybean cultivation, social participation, socio-economic status, extension contact, scientific orientation were positively and significantly correlated with the knowledge of soybean growers about soybean cultivation practices. The findings of the regression analysis revealed that all the fourteen independent variables contributed 53.03 per cent influence in adoption of the respondents.

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Soybean in Indian agriculture as a pulse and oil seed crop has attained importance due to its nutritional and industrial value. It occupies an important place as it gets more foreign exchange from the export of soya powder due to its greater demand in the international market. It is highly nutritious food item, as it contains 20 per cent oil and 40 per cent protein. In addition, it also contains 21 per cent carbohydrates, 11.5 per cent iron, 4 per cent mineral salts like calcium, phosphate and many important vitamins too (Damordjati *et al.*, 1996).

Soybean crop is originated from China. In India it is cultivated in the states of Madhya Pradesh, Maharashtra, Rajasthan, Andhra Pradesh, Karnataka and Chattisgarh. Maharashtra is the second largest soybean growing state in the country. From the statistical information available, it is surprising to note that the area under cotton and other crops is decreasing and the area under soybean is increasing practically every year in Vidarbha region.

Soybean cultivation has become more prominent in Buldana district, in Buldana, Chikhli and Mehkar Panchayat Samitis in particular from last 14 years as it fetches higher price and less input requirement and therefore, it has replaced the crops like cotton, sorghum,

used, mung etc. to some extent.

### RESEARCH PROCEDURE

The area under soybean crop is increasing gradually year after year. Hence, there is a need to increase the average yield of soybean. The present investigation, therefore, aims to ascertain the factors responsible for adoption of improved cultivation practices of soybean by the farmers.

The study was carried out in purposively selected Buldana, Chikhli and Mehkar Panchayat Samitis of Buldana district of Vidarbha region in Maharashtra State, as the area under soybean crop is increasing every year and topping the list of Panchayat Samiti in rank order of first, second and third, respectively.

Out of the 13 Panchayat Samitis in Buldana district, Buldana, Chikhli and Mehkar Panchayat Samitis were selected considering the increasing trend of soybean area since last eight years, and ranking first, second and third in soybean area as compared to other panchayat samitis. From each of the three panchayat samitis thus selected five villages were considered for study. The total sample

villages thus constituted fifteen for the study.

The list of farmers growing soybean crop since last three years, consequently in the selected 15 villages was obtained. The sample of 150 farmers was drawn with the help of disproportionate random sampling method, only from those farmers whose area under soybean crop was increased as compared to last year.

Among the cultivation practices of soybean recommended by Dr. P.D.K.V., Akola, a few technologies were selected by contacting specialists of Oilseed Research Unit, Pulse Research Unit, Agronomy, Pathology and Entomology Department of the University.

## RESEARCH ANALYSIS AND REASONING

The results obtained from the present investigation have been discussed in the following sub heads :

### Practicewise knowledge about recommended soybean cultivation practices:

Knowledge is essential for adoption of new technology. With this view the information with regards to the knowledge possessed by the respondents about soybean cultivation practices was collected. The data thus obtained are presented in Table 1.

It is evident from the distribution in Table 1 that cent per cent of the respondents were found to be completely aware about land preparation operations *i.e.* ploughing, harrowing and method of sowing *i.e.* drilling, 95 to 110 days duration of soybean crop, maturity signs of soybean crop *i.e.* drying of leaves and yellowing of pods, average yield of soybean crop *i.e.* 15 to 25 q/ha, as well as proper storage of produce of soybean at dry place. Further majority of the respondents had knowledge about the proper hoeing time (98.67%), ideal sowing time (98.00%), medium to heavy soil type required for soybean (96.67%), high yielding varieties *i.e.* JS-335, TAMS-38, PK-472 (49.00%), 75 kg/ha recommended seed rate (92.67%), 3-4 cm sowing depth (92.00%), intercropping with tur and sorghum (90.67%), 30 x 8 or 45 x 5 cm spacing (86.67%), recommended chemical fertilizer *i.e.* urea and SSP are (71.33%), application of protective irrigation at flowering and grain filling stage (71.33%), insect pest namely stem fly, girdle beetle and leaf eating caterpillar (68.66%), recommended control measure for pests (65.33%), major disease of soybean crop *i.e.* bacterial leaf spot and rust (65.33%), recommended control measure for disease (60.00%), chemical recommended for seed treatment (53.33%), recommended 'N' fixing biofertilizers (46.67%), recommend 'N' biofertilizer to soybean (42.00%), recommendation of PSB for soybean (38.66%). However,

some of the recommended practices like quantity of chemical fertilizers *i.e.* 35 kg urea and 235 kg SSP/ha (38.66) and recommended micronutrients like sulphur and zinc sulphate (22.67%) were known to few of the respondents.

Hence, it is concluded that majority of the respondents had knowledge about recommended cultivation practices of soybean namely land preparation operations, duration of soybean crop, maturity sign of soybean crop, average yield, storage, hoeing time, ideal sowing time, soil type, high yielding varieties, seed rate, sowing depth required for soybean cultivation.

### Knowledge index:

The distribution of respondents according to level of knowledge in Table 2 revealed that majority of the soybean growers (75.33%) were found in high category of knowledge, followed by 24.67 per cent in medium category of knowledge. None of them was found in low knowledge category.

Thus, it could be inferred that majority of soybean growers had high level of knowledge about improved cultivation practices recommended for soybean. These findings were in line with the findings of Shambharkar (1997) and Shinde (2000) who reported that majority of the respondents had high level of knowledge.

### Relational analysis:

In order to find out the relationship of the selected characteristics of the respondents with knowledge and adoption of recommended soybean cultivation practices, correlation coefficients were worked out. The results obtained from the relational analysis have been presented below.

### Coefficient of correlation:

As evident from previous studies, various independent variables influence knowledge. The knowledge of respondents here may have also been a function of different correlates. The Table 3 indicates correlates of knowledge.

It is evident from Table 3, that education, land holding, occupation, soil type, annual income, cropping pattern, experience in soybean cultivation, social participation, socio-economic status, extension contact and scientific orientation established highly significant relationship with knowledge of cultivation practices recommended for soybean cultivation. The variable age established negatively significant relationship with knowledge. It was interesting to note that the risk preference established non significant relationship and the variable market orientation

**Table 1 : Distribution of respondents according to their knowledge about soybean cultivation practices**

Sr. No.	Recommended soybean cultivation practices	Respondent (n=150)	
		Frequency	Percentage
1.	Soil type ( medium to heavy)	145	96.67
2.	Names of two land preparation operation (ploughing, harrowing)	150	100.00
3.	Name of high yielding varieties (JS-335, TAMS-38,PK-472)	141	94.00
4.	Chemical recommended for seed treatment (3g thirum + 1 g carbendazim)	80	53.33
5.	Recommendation of PSB for soybean and quantity of PSB/10 kg seed (250 g)	58	38.66
6.	Recommended N fixing biofertilizer for soybean ( <i>Rhizobium japonicum</i> )	70	46.67
7.	Quantity of 'N' fixing biofertilizer per 10/kg seed (250 g)	63	42.00
8.	Ideal sowing time (15 June to 15 July)	147	98.00
9.	Method of sowing (drilling)	150	100.00
10.	Sowing depth (3-4 cm)	138	92.00
11.	Recommended spacing (30 x 8 and 45x 5cm)	130	86.67
12.	Recommended seed rate (75 kg/ha)	139	92.67
13.	Recommended chemical fertilizer (urea and super phosphate)	107	71.33
14.	Recommended quantity (N:P:K = 30:75:00)	58	38.66
15.	Recommended micronutrients (sulphur and zinc sulphate)	34	22.67
16.	Recommended intercropping (soybean + sorghum + jowar 6:2:1 or 9:2:1 or soybean + tur 2:1)	136	90.67
17.	Proper hoeing time (15-20 and 35-40 days after sowing)	148	98.67
18.	Time of application of protective irrigation (At flowering and grain filling)	107	71.33
19.	Major pest of soybean crop (stemfly, girdle beetle and leaf eating caterpillar)	103	68.66
20.	Recommended control measure for pests (clopriphos and quinolphos)	98	65.33
21.	Major disease of soybean crop (bacterial leaf spot and rust)	98	65.33
22.	Recommended control measures for diseases (dithane M-45, copper oxichloride) 150	90	60.00
23.	Duration of soybean crop (95-110 day150s)	150	100.00
24.	Maturity signs of soybean crop (drying of leaves and yellowing of pods)	150	100.00
25.	Average yield of soybean crop (15-25 q/ha)	150	100.00
26.	Care during storage (store at dry place)	150	100.00

**Table 2 : Distribution of the respondents according to their knowledge index**

Sr. No.	Knowledge	Respondent	
		Frequency (n=150)	Percentage
1.	Low	00	00.00
2.	Medium	37	24.67
3.	High	113	75.33
	Total	150	100.00

X = 78.20

S.D. = 12.93

established negative and non significant relationship with knowledge.

Manjula (1993), Dupare (1995), Kumbhare (1996), Shambharkar (1997), Deshmukh (1999), Shinde (2000), Wane (2000), Jaiswal (2001), Mahajan (2002) and Asane (2003) reported the same findings as of the present study.

### Multiple regression analysis:

As one of the objectives and in order to find out the

**Table 3 : Coefficient of correlation of characteristics of the respondents with their knowledge**

Sr. No.	Variables	'r' value
1.	Age	-0.3037**
2.	Education	0.6517**
3.	Land holding	0.2947**
4.	Occupation	0.2725**
5.	Soil type	0.2388**
6.	Annual income	0.3649**
7.	Cropping pattern	0.2914**
8.	Experience in soybean cultivation	0.3043**
9.	Social participation	0.3245**
10.	Socio-economic status	0.4687**
11.	Extension contact	0.5696**
12.	Market orientation	-0.0788 <sup>NS</sup>
13.	Risk preference	0.1150 <sup>NS</sup>
14.	Scientific orientation	0.2230**

\*\* indicates significance of value at P=0.01

NS= Non-significant

**Table 4 : Multiple linear regression coefficient of knowledge**

Sr. No.	Variables	`r' value		
		Reg. coefficient	SE(b)	`t' value
1.	Age	-0.1255	0.0941	1.3328 <sup>NS</sup>
2.	Education	1.6050	0.3734	4.2974**
3.	Land holding	-0.1699	0.5351	0.3175 <sup>NS</sup>
4.	Occupation	1.0967	1.1571	0.9478 <sup>NS</sup>
5.	Soil type	3.3837	1.8621	1.8170 <sup>NS</sup>
6.	Annual income	0.00004	0.00002	1.7771 <sup>NS</sup>
7.	Cropping pattern	0.5693	0.7795	0.7303 <sup>NS</sup>
8.	Experience in soybean cultivation	0.0053	0.6657	0.0080 <sup>NS</sup>
9.	Social participation	0.4251	0.5471	0.7770 <sup>NS</sup>
10.	Socio-economic status	-0.8711	0.7877	1.1058 <sup>NS</sup>
11.	Extension contact	1.1723	0.3905	3.0017**
12.	Market orientation	-1.1586	0.8403	1.3787 <sup>NS</sup>
13.	Risk preference	0.2956	0.5404	0.5470 <sup>NS</sup>
14.	Scientific orientation	0.1727	0.6959	0.2477 <sup>NS</sup>

R<sup>2</sup> = 0.5303

`F' value = 10.8891

X – F value = 10.8891 with D.F. are (14, 135)

\*\* indicates significance of value at P=0.01

NS = Non-significant

relative contribution of independent variables to the variation in dependent variables *i.e.* knowledge and adoption, the multiple regression analysis was employed.

The data in Table 4 revealed that, coefficient of determination (R<sup>2</sup>) was 0.5303 means 53.03 per cent of the total variation in respondents knowledge of cultivation practices recommended for soybean was explained by selected 14 variables.

It is observed from the Table 4 that the independent variables namely education and extension contact had significantly contributed in explaining the knowledge. The 't' value for education (t=4.2974) and extension contact (t=3.0017) were significant at 0.01 level of probability. This indicates that for every unit increase in value of education, the value of knowledge index would increase by 1.605 units when all the variables kept constant at their geometric mean level, whereas the extension contact had significantly contributed to the increase in the knowledge which indicates that for every unit increase in the value of knowledge index would increase by 1.172 units. Thus among the variables the contribution of education was highest followed by extension contact.

The coefficient of remaining variables namely age, land holding, occupation, soil type, annual income, cropping pattern, experience in soybean cultivation, social participation, socio-economic status, market orientation, risk preference and scientific orientation had no influence on the knowledge of the respondents.

### Conclusion:

It can be concluded that the majority of the

respondents know the recommended practices of soybean cultivation like preparatory tillage (100.00%), method of sowing (100.00%), sowing time (98.00%), proper hoeing time (98.67%), soil type (96.67%), high yielding varieties (94.00%), sowing depth (92.00%) and recommended intercropping requirements for soybean (90.67%). Majority of them had a high level of knowledge (75.33%) of cultivation practices recommended for soybean.

The findings of the relational analysis revealed that out of fourteen characteristics studied, eleven variables namely education, land holding, occupation, soil type, annual income, cropping pattern, experience in soybean cultivation, social participation, socio-economic status, extension contact, scientific orientation were positively and significantly correlated with the knowledge of soybean growers about soybean cultivation practices. The findings of the regression analysis revealed that all the fourteen independent variables contributed 53.03 per cent influence in knowledge of the respondents.

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**LITERATURE CITED**

- Asane, P.G. (2003). Knowledge and adoption of cultivation practices recommended for soybean. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).
- Damordjati, D.S., Widowati, S. and Taslim, H. (1996). Soybean processing and utilization in Indonesia. *Indonesia Agric. Res. & Dev. J.*, **18**(1):13-25.
- Deshmukh, S.B. (1999). Knowledge and adoption of improved farm practices by the Krishi Vigyan Kendra beneficiaries. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).
- Dupare, B.V. (1995). Factors affecting adoption of soybean cultivation technology. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).
- Jaiswal, A.N. (2001). Extent of adoption of soybean technology. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).
- Kumbhare, N.V. (1996). Impact of training organized by Krishi Vigyan Kendra on the adoption of improved practices by the farmers. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).
- Mahajan, V.N. (2002). Knowledge and adoption of recommended cultivation practices of *Kharif* sunflower. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).
- Manjula, N. (1993). Impact of training on knowledge and adoption behaviour of trained farm women. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).
- Shambharkar, Y.B. (1997). Involvement of farmers in feed back management in agriculture with respect to soybean crop. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).
- Shinde, J.S. (2000). Knowledge and adoption of weedicides in soybean by the farmers. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).
- Wane, R.B. (2000). Adoption behaviour of soybean growers. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, M.S. (India).

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