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Uttam Kumar Tripathi
SRF- KVK Nowgong
Chhatarpur, Madhya Pradesh,
India

To determine the adoption behavior of maize growers about recommended maize production technology

Uttam Kumar Tripathi

Abstract
Knowledge is a crucial factor which is necessary to do a practice perfectly and efficiently. Lack of knowledge creates gaps in complete adoption of recommended practice. Maximum maize growers suggested that proper knowledge about quantity and method of use of materials should be provided by the various responsible agencies while trainings in respect of improved maize production technology should be conducted at village level.
Smooth flow of fund is essential for performing the all the farming activities. It is noticed in so many studies that farmers are not getting benefits of credit facilities. Maximum respondents said that funding facility at the time of crop period should be made available by the various responsible agencies.

Keywords: Improvement in adoption behavior, recommended maize production technology

Introduction
Maize is considered the third most important cereal crop after rice and wheat in the world. This cereal is referred as Miracle crop and Queen of the Cereals due to its high productivity potential compared to other Graminacea family members. It is a seasonal crop, annually it can be harvested thrice i.e., in Kharif, Rabi and summer seasons. Maize usually grown as a pure crop in some instances it can be taken up as an inter crop with different crop combinations like sugar cane, cotton, vegetables, legume crops etc.

On global front, in recent past, maize gained a tremendous importance on rising demand from diversified sectors like food, feed and ethanol production. As a result since last one decade acreage under maize cultivation is continuously on increasing trend to meet the rising demand. Acreage under corn cultivation increased to 157.1 million hectares in 2007-08 up by 14.5% from 137.19 million hectares in the year 2002-03.

In India, maize is the third important cereal crop cultivated after rice and wheat cultivation. In the world production, India stands in fifth position interns of corn production. In India in last one decade maize production have shown a tremendous improvement from 11.50 million tonnes to present level of 19.73 million tonnes due to increased acreage on increasing demand form feed industry, export demand, ethanol production demand etc. From sole kharif crop this year harvested about 15.5 million tonnes and rabi crop estimating around 4.23 million tonnes. This year India's production had broken the historical high production of 19.73 million tonnes in 2008-09.

Material and methods
Variables used in the study
There were 2 dependent and 10 independent variables used for the study purpose which are mentioned in Table 1.

Concepts and Operationalization
In this study, there were various terms and concepts with specific meaning, which were defined and operationalization as follows:

Correspondence
Uttam Kumar Tripathi
SRF- KVK Nowgong
Chhatarpur, Madhya Pradesh,
India

Table 1: List of variables used in the study

S. No.	Particulars
	Dependent variable
1.	Knowledge about recommended maize production technology
2.	Adoption of recommended maize production technology
	Independent variables
1.	Age
2.	Educational qualification
3.	Size of land holding
4.	Social participation
5.	Socio-economic status
6.	Attitude towards new technologies
7.	Mass media exposure
8.	Extension participation
9.	Innovativeness
10.	Annual income

Independent variables
Age
Age refers to the number of years an individual has lived since his birth at the time of interview. Age of respondent was recorded by asking him what his age was. The categorization was followed according to their actual chronological age. The categorization was based on the scoring which is as follows:

S. No.	Category	Scores
1.	Young (Below 35 years)	1
2.	Middle (36-55 years)	2
3.	Old (Above 55 years)	3

Educational qualification
Education was operationalized as the number of year of formal education acquired by the respondent at the time of enquiry and the scores assigned according to socio-economic status scale developed by the Venkatarmaiah and Sethurao (1983). The status of education was considered, illiterate, functionally literate, primary school, middle school, high school and college. The categorization was as follows:

S. No.	Category	Scores
1	Illiterate	0
2	Primary school	1
3	Middle school	2
4	High school	3
5	Higher secondary	4
6	College and above	5

Size of land holding
It is the area of land possessed by an individual. The land holding was measured with the help of socio economic status scale of Venkatramaiah and Sethurao (1983) with minor modifications. The categorization and scores given are as follows:

S. No.	Category	Scores
1	Marginal farmers (<1 ha.)	1
2	Small farmers (1-2 ha.)	2
3	Medium farmers (2.1 - 5 ha.)	3
4	Large farmers (> 5 ha.)	4

Social participation:
It refers to the participation of an individual in any social or political organization. Social participation was measured with the help of scale developed by Pareek and Trivedi (1963). The categorization was as follow:

S. No	Category	Scores
1	Low	Mean- SD
2	Medium	Mean ± SD
3	High	Mean + SD

Socio-economic status
It refers to the position of an individual occupied in a society in comparison to other individuals with respect to the possession of land holding, occupation, level of education, caste, type and number of houses and size of family, farm power, material possession and social participation. It was measured with the Socio-economic Status Scale developed by Pareek (1963).

S. No	Category	Scores
1	Poor	Mean- SD
2	Medium	Mean ± SD
3	Good	Mean + SD

Attitude towards new technologies
Attitude has been defined as the degree of positive or negative effect associated with some psychological object. Attitude in this study refers to the feeling and reaction of the farmers towards the indigenous technical knowledge. The attitude of the farmers was measured with the help of scale developed by Singh (1990). The categorization was as follows:

S. No	Category	Scores
1	Unfavourable	mean - 1 SD
2	Neutral	mean ± 1 SD
3	Favourable	mean + 1 SD

Mass media exposure
Mass media exposure refers to the extent to which the people are exposed to the different message or information from various mass media like radio, television, newspaper and other reading materials. It was measured in the present study with the help of scale developed by Md. Salim. The respondents were asked about the number of times they were exposed to radio, television, newspaper and magazine. The score from each individual was obtained by summing up the scores received from him for all the four media. The categorization was as follows:

S. No	Category	Scores
1	Low	Mean- SD
2	Medium	Mean ± SD
3	High	Mean + SD

Result
The results of the present investigation have been described in this chapter, which has been organized according to the objectives of the study. The information which was collected from a sample of 120 maize growers through the structural interview schedule was processed, keeping in view the specific objectives of the study. The results obtained are interpreted and presented under the following sections:

Table: Extent of adoption of recommended maize production technology by the maize growers

S. No.	Practices	Extent of adoption						Total
		Low		Medium		High		
		No.	%	No.	%	No.	%	
I	Field preparation							
1.	No. of ploughing	22	18.33	22	18.33	76	63.34	120
2.	Time of ploughing	24	20.00	25	20.83	71	59.17	120
3.	Leveling	30	25.00	24	20.00	66	55.00	120
II	Seed and sowing							
1.	Improved varieties	38	31.67	39	32.50	43	35.83	120
2.	Optimum seed rate	47	39.17	45	37.50	28	23.33	120
3.	Use of seed treatment	46	38.33	36	30.00	38	31.67	120
4.	Seed treatment methods	51	42.50	38	31.67	31	25.83	120
6.	Quantity of seed treatment materials	50	41.67	44	36.66	26	21.67	120
7.	Right time of sowing	33	27.50	43	35.83	44	36.67	120
8.	Methods of sowing	34	28.33	48	40.00	38	31.67	120
III	Manures and chemical fertilizers							
1.	Green manure	48	40.00	39	32.50	33	27.50	120
2.	Farm Yard Manure/Compost	36	30.00	40	33.33	44	36.67	120
4.	Optimum quantity per hectare	41	34.17	42	35.00	37	30.83	120
5.	Methods of application of FYM	36	30.00	49	40.83	35	29.17	120
6.	Time of application of FYM	44	36.67	40	33.33	36	30.00	120
7.	Use of chemical fertilizers	40	33.33	44	36.67	36	30.00	120
8.	Use of micro nutrients	70	58.33	40	33.33	10	8.34	120
9.	Recommended dose of chemical fertilizers	57	47.50	35	29.17	28	23.33	120
10.	Method of application for chemical fertilizers	47	39.17	50	41.66	23	19.17	120
11.	Time of application for chemical fertilizers	48	40.00	53	44.17	19	15.83	120
IV.	Irrigation management							
1.	Time of irrigation	39	32.50	40	33.33	41	34.17	120
2.	Methods of irrigation	42	35.00	40	33.33	38	31.67	120
3.	Critical stages of maize	47	39.17	53	44.16	20	16.67	120
4.	Number of irrigation in maize	35	29.17	52	43.33	33	27.50	120
V	Weed management							
1.	Time of weeding	36	30.00	41	34.17	43	35.83	120
2.	Methods of weeding	31	25.83	44	36.67	45	37.50	120
3.	Use of weedicides	51	42.50	49	40.83	20	16.67	120
4.	Quantity of weedicides	53	44.17	47	39.16	20	16.67	120
5.	Methods of application	44	36.67	49	40.83	27	22.50	120
VI	Insects and pest management							
1.	Stages of infestation	62	51.67	46	38.33	12	10.00	120
2.	Methods of insect control	48	40.00	51	42.50	21	17.50	120
3.	Use of insecticides	48	40.00	45	37.50	27	22.50	120
4.	Quantity of insecticides	49	40.83	49	40.84	22	18.33	120
5.	Methods of application	44	36.67	50	41.66	26	21.67	120
VII	Disease management							
1.	Stages of infestation	64	53.33	48	40.00	8	6.67	120
2.	Methods of disease control	52	43.33	45	37.50	23	19.17	120
3.	Use of fungicides	59	49.17	40	33.33	21	17.50	120
4.	Quantity of fungicides	55	45.83	40	33.34	25	20.83	120
5.	Methods of application	47	39.17	50	41.66	23	19.17	120
VIII	Harvesting							
1.	Right time of harvesting	26	21.67	30	25.00	64	53.33	120
2.	Methods of harvesting	27	22.50	50	41.67	43	35.83	120

I. Field preparation: Table 2 reveals the data regarding adoption of maize growers of field preparation practices. Three items were considered under this practice set.

Majority of maize growers possessing high adoption in case of numbers of ploughing (63.34%), followed by a similar percentage (18.33%) had both low and medium adoption respectively.

Majority of the maize growers who were identified to have high adoption regarding time of ploughing (59.17%), followed by medium and low adoption by 28.83 and 20.00 percent maize growers respectively.

High adoption possessed by majority of maize growers (55.00%) in case of leveling followed by 25.00 and 20.00

percent maize growers who had low and medium adoption respectively.

II. Seed and sowing: Table 2 reveals the data regarding adoption of seed and sowing practices by the respondents. Eight items were considered under this practice set.

The higher percentage of maize growers (35.83%) found to have high adoption of improved varieties followed by 32.50 and 31.67 percent maize growers had medium and low adoption respectively.

Out of the total respondents, 39.17 percent possessed low adoption of optimum seed rate followed by medium and high adoption possessed by 37.50 and 23.33 percent maize

growers, respectively.

A higher percentage of the respondents (38.33%) had low adoption of seed treatment followed by medium and high adoption (31.67 & 30.00% respectively).

Higher percentage of the respondents (42.50%) had low adoption of seed treatment methods followed by medium (31.67%) and high adoption (25.83%).

Maximum numbers of the respondents (36.67%) had high adoption of right time of sowing followed by 35.83 and 27.50 percent respondents had medium and low adoption respectively.

Highest numbers of respondents (40.00%) had medium adoption of methods of sowing followed by 31.67 and 28.33 percent respondents had low and high adoption respectively.

III. Manures and chemical fertilizers: The data in table 2 reveals the adoption of maize growers regarding manures and chemical fertilizers. Nine items were considered in this practice set.

The higher percentage of maize growers (40.00%) found to have low adoption of green manure followed by 32.50 percent of respondents had medium and 27.50 percent had low adoption.

Out of the total respondents, highest 36.67 percent possessed high adoption of farm yard manure/compost followed by medium and low adoption possessed by 33.33 and 30.00 percent maize growers, respectively.

A higher percentage of the respondents (40.83%) had medium adoption of methods of application followed by low adoption (30.00%) and high adoption (29.17%).

Higher percentage of the respondents (36.67%) had low adoption of time of application followed by medium (33.33%) and low adoption (30.00%).

Out of the total respondents, 36.67 percent had medium adoption of chemical fertilizers followed by 33.33 and 30.00 percent had low and high adoption respectively.

Majority of the respondents (58.33%) had low adoption of micro-nutrients followed by 33.33 percent respondents had medium and 8.34 percent had high adoption respectively.

Highest numbers of respondents (41.66%) had medium adoption of methods of application for chemical fertilizers followed by 39.17 and 19.17 percent respondents had low and high adoption respectively.

A higher percentage of the respondents (44.17%) had medium adoption of time of application for chemical fertilizers followed by low adoption (40.00%) and high adoption (15.83%).

IV. Irrigation management: The data in table 2 reveals the adoption of maize growers regarding irrigation management. Four items were considered in this practice set.

The higher percentage of maize growers (34.17%) found to have high adoption of time of irrigation followed by 33.33 and 32.50 percent maize growers had medium and low adoption respectively.

Out of total respondents, 35.00 percent possessed low adoption of methods of irrigation followed by medium and high adoption possessed by 33.33 and 31.67 percent maize growers, respectively.

About 44.16 percent respondents had medium adoption of critical stages of maize followed by 39.17 and 16.67 percent had low and high adoption respectively.

A higher percentage of the respondents (43.33%) had medium adoption of numbers of irrigation in maize followed by 29.17

percent respondents had low and 27.50 percent had high adoption respectively.

V. Weed management: The data in table 2 reveals the adoption of maize growers of weed management. Five items were considered in this practice set.

The higher percentage of maize growers (35.83%) found to have high adoption of time of weeding followed by 34.17 and 30.00 percent maize growers had medium and low adoption respectively.

A higher percentage 37.50 percent respondents possessed high adoption of methods of weeding followed by medium and low adoption possessed by 36.67 and 25.83 percent maize growers, respectively.

About 42.50 percent respondents had low adoption of use of weedicides followed by 40.83 and 16.67 percent had medium and high adoption respectively.

A higher percentage of the respondents (44.17%) had low adoption of quantity of weedicides in maize followed by 39.16 percent respondents had low and 16.67 percent had high adoption respectively.

VI. Insect and pest management: The data in table 2 reveals the adoption of maize growers of insect and pest management. Five items were considered in this practice set.

Majority of the maize growers (51.67%) found to have low adoption of stages of infestation followed by 38.33 and 10.00 percent respondents had both medium and high adoption.

VII. Disease management: The data in table 2 reveals the adoption of maize growers of insect and pest management. Five items were considered in this practice set.

Majority of the respondents (53.33%) had low adoption of stages of infestation of diseases followed by medium adoption (40.00%) and high adoption (6.67%).

About 43.33 percent respondents had low adoption of methods of disease control followed by 37.50 and 19.17 percent had medium and high adoption respectively.

A higher percentage of the respondents (49.17%) had both low adoption of quantity of fungicides followed by medium and high adoption (33.33 and 17.50% respectively).

Maximum numbers of the respondents (45.83%) had low adoption of use of fungicides followed by 33.33 and 20.83 percent respondents had medium and high adoption respectively.

A higher percentage of the respondents (41.66%) had medium adoption of methods of application of fungicides followed by 39.17 percent respondents had low and 19.17 percent had high adoption respectively.

VIII. Harvesting: The data in table 2 reveals the adoption of maize growers of harvesting practices. Two items were considered in this practice set.

Majority of the respondents (53.33%) had high adoption of right time for harvesting followed by medium adoption (25.00%) and high adoption (21.67%).

Maximum numbers of the respondents (41.67%) had medium adoption of methods of harvesting followed by 35.83 and 22.50 percent respondents had high and low adoption respectively.

1. Most of the respondents (38.33%) belonged to middle age group (36 to 50 years). it may be stated that majority of respondents were middle (36 to 50 years) to young (20 to 35 years) in respect to age group whereas 26.67

percent of maize growers were of old age group.

2. Maximum of the maize growers (25.83%) were educated up to higher secondary level. it can be concluded that overall majority of the maize growers were literates and maximum of the maize growers were higher secondary passed.

3. Maximum numbers of the maize growers (29.17 percent) were found to have marginal size of land holding it also concluded that overall majority of the maize growers having marginal to medium size of land holding.

4. Maximum numbers of the maize growers (46.66%) with those whose participation was high in social activities.

5. Most of the maize growers (39.17%) had low socio-economic status. it may be also stated that the maize growers were medium to low in socio-economic status.

6. Most of the maize growers (40.00%) had neutral attitude towards new technologies.

7. Higher percentage of the maize growers 40.00 percent were in medium mass media exposure category.

8. A higher percentage of the maize growers (45.83%) had medium extension participation.

9. Majority of the maize growers (53.33%) were found to had medium innovativeness.

10. A higher percentage of the maize growers, 44.17 percent had medium annual income.

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