RESEARCH ARTICLE

KNOWLEDGE AND ADOPTION OF RECOMMENDED MAIZE PRODUCTION TECHNOLOGY

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Abstracts: This investigation was carried out in three district of Bastar plateau of Chhattisgarh State to assess the level of knowledge and adoption of recommended maize production technology. 270 farmers were considered as respondents for this study. Respondents were interviewed through personal interview. Collected data were analyzed with the help of suitable statistical methods. The analysis of the results showed that overall knowledge of recommended maize production technology, 72.96% respondents had medium level of knowledge and 73.70% respondents had medium level of adoption regarding recommended maize production technology.

Keywords: Maize production, Knowledge, Adoption, Technology

INTRODUCTION

Maize (*Zea mays* L.) is one of the most important cereal crops in the world and has the highest production among all the cereals. It is a miracle crop, it has very high yield potential, there is no cereal on the earth which has so immense potentiality and that is why it is called 'queen of cereal'. Besides, maize has many types like normal yellow, white grain, sweet corn, baby corn, pop corn, waxy corn, high amylase corn, high oil corn, quality protein maize, etc. Maize is the most important crop in the world after wheat and rice (Verheys, Undated). It is an important staple food in many countries and is also used as animal feed and many industrial applications. Maize is 3rd major crop in India after rice and wheat (Cox, R., 1956 & Reddy *et. al.* 2013). Maize is important cereal crop which provides food, feed, fodder and serves as a source of basic raw material for a number of industrial products viz, starch, protein, oil, food sweeteners, alcoholic beverages, cosmetics, bio-fuel etc, it is cultivated over 8.12 million hectare area with an annual production of 19.77 million tones and an average productivity of 2,435 kg ha-1 (Langade *et. al*. 2013). Maize is the third most important food grain in India after wheat and rice. In India, about 28% of maize produced is used for food purpose, 11% as livestock feed, 48% as poultry feed, 12% in wet milling industry (for example starch and oil production) and 1% as seed (AICRP on Maize, 2007). Maize crop in the state has an area of 123430 ha with the production 254134 MT (C.G. Agriculture Statistic Report 2014).The area and production of Maize crop in Kanker district was 11511 ha and 25705 MT respectively, area of maize crop in Kondagaon district is 13586 ha with production of 31831 MT while the coverage of maize in Bastar district is 9560 ha with the production of 22398 (C.G. Ag. statistic Report 2014). Rogers(1983) Knowledge is of three types namely awareness knowledge, how to knowledge and principle knowledge In the present study operational knowledge was studied and study is confined as the technical information possessed by the respondents about recommended maize production technology. A device was developed to measure the knowledge level of respondents regarding to recommend maize production technique by adopting the scale suggested by Paikra (2014). Rogers (1995) described the adoption is mental process through which an individual passes from hearing about an innovation to final adoption. Adoption refers to the extent of use of recommended cultivation technique of maize by the respondents. The present study was undertaken with specific objectives to assess the level of knowledge and extent of adoption about recommended maize production technology among the respondents of Bastar plateau of Chhattisgarh.

MATERIAL AND METHODS

The present study was carried out in Bastar plateau of Chhattisgarh State. Three districts in the zone *i.e.* Kanker, Kondagaon and Bastar were undertaken for the study. Two blocks from each of the selected district Block Antagarh and Koylibeda in Kanker District, Keshkal and Baderajpur in Kondagaon, Bastar and Bakawand in Bastar District. Each selected block 3 villages *viz.* Irrabodi, Amagaon, Godri, in Antagarh Block, Chotekapsi, Kodosalhebhat, Manegaon, in Koylibeda Block, Cherbeda, Toraibeda, Amoda in Keshkal Block, Baderajpur, Toraipara, Khargaon(Manduki) in Baderajpur Block, Ikchapur, Bagmohlai, Dubeumargaon in Bastar Block, Belputi, Khotlapal and Mangnar in Bakawand Block were selected and from each selected village, 15 farmers were selected randomly. In this way total two hundred seventy respondents were selected to response as per the interview schedule designed for the study. Collected data were analyzed by the help of various statistical

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tools *i.e.* frequency, percentage, mean, standard deviation, correlation and regression, *etc.*

The knowledge test was composed of items called question for constructing the knowledge tests of all the recommended practices of maize production technology. A set of questions was developed and discussed with the subject matter specialist in the disciplines with subject matter specialist in the disciplines of advisory committee and then finalized. Total no. of question was 13. A device was developed to measure the knowledge level of respondents regarding to recommend maize production technique by adopting the scale categorised as follow.

Categories	Score
Incomplete knowledge	0
Partial knowledge	1
Complete knowledge	2

A knowledge index was worked out to assess the level of knowledge of each respondent with the help of following equation.

$$KI = \frac{O^i}{S} \times 100$$

Where,

K.I. = Knowledge index of I^{st} respondent

O^i = Total score obtained by the I^{st} respondent

S = Total obtainable score

Considering the knowledge score of the respondents were categorized in to following groups on the basis of knowledge index.

Category	Score
Low	Up to 33.33%
Medium	33.34-66.66%
High	Above 66.66%

To measure the extent of adoption, the list of recommended practices was prepared and responses for the each practice were obtained into three- point continuum as under.

Categories	Score
Not adopted	0
Partial adopted	1
Fully adopted	2

Adoption index was worked out for each respondent by using the following formula:

$$A.I = \frac{O^i}{S} \times 100$$

Where,

AI = Adoption index of i^{st} respondent

O^i = Total score obtained by the i^{st} respondent

S = Total obtainable score

Considering the adoption score of the respondents were categorized in to following groups on the basis of adoption index.

Category	Score
Low	Up to 33.33%
Medium	33.34-66.66%
High	Above 66.66%

RESULT AND DISSCUSION

The result and discussion of the present study have been summarized under the following heads:

Level of knowledge

The extent of overall knowledge of the respondent's data showed in Table No.1. It indicated 72.96% respondents had to medium level of knowledge,

followed 15.93% respondents were high level of knowledge and 11.11% respondents had to low level of knowledge about the maize production. The data indicates among the respondents regarding to recommend practices of maize production was observed medium level of knowledge respectively. Similar findings were supported by Yadav (2014) who reported 68.83% respondents had belong to medium level of knowledge about the improved tomato production technology in the study area.

Table 1. Extent of Knowledge of the respondents regarding recommended practices of maize cultivation (n=270)

S.N.	Category	Frequency	Percentage
1	Low (Up to 33.33%)	30	11.11
2	Medium (33.34-66.66%)	197	72.96
3	High (Above 66.66%)	43	15.93

The extent of knowledge had been tested with suitable parameters and represented in Table No. 2. The knowledge about the improved technology of maize cultivation from the different respondents had been analyzed and interpreted. It was observed that majority of the respondents of about 54.44% had partial knowledge about the selection of suitable land for maize cultivation and only 35.19% of the respondents had clear knowledge about the suitable land selection for the maize crop. The extent of knowledge about the selection of improved varieties and seed rate was comparatively higher as 45.93 and 51.50% respectively while, 43.70% and 44.40% of the respondents had partial knowledge about the improved varieties and seed rate, respectively. Poor knowledge of seed treatment was exhibited from the respondents. Only 0.74% of the respondents had complete knowledge of seed treatment and rest had shown the incomplete or partial knowledge.

Table 2. Distribution of the respondents by their extent of knowledge regarding to recommended practices of maize cultivation (n=270)

S.N.	Practice	Extent of Knowledge					
		Compl.		Partial		Incom.	
		F	Percentage	F	Percentage	F	Percentage
1	**Selection of suitable land**	95	35.19	147	54.44	28	10.37
2	**Improved varieties**	124	45.93	118	43.70	28	10.37
3	**Seed Rate**	139	51.50	120	44.40	11	4.10
4	**Seed Treatment**	2	0.74	5	1.85	263	97.41
5	**Sowing Time**	205	75.93	36	13.33	29	10.74
6	**Thinning**	9	3.33	51	18.89	210	77.78
7	**Fertilizer Application**						
	Chemical Fertilizer	45	16.67	218	80.74	7	2.59
	Organic Manure	11	4.10	220	81.50	39	14.40
8	**Micronutrient**	13	4.80	112	41.50	145	53.70
9	**Weed Control**						
	Manual	209	77.40	47	17.40	14	5.20
	Chemical	94	34.81	45	16.67	131	48.52
10	**Irrigation**	56	20.74	158	58.52	56	20.74
11	**Plant Protection**	19	7.04	145	53.70	106	39.26
12	**Harvesting**						
	Cob form	112	41.48	2	0.74	156	57.78
	Grain	261	96.67	7	2.52	2	0.74
13	**Threshing**						
	Maize Sheller	0	0.00	2	0.74	268	99.26
	Maize Thresher	261	96.67	7	2.52	2	0.74

The knowledge about the right time of sowing was expressed by the respondents. It was observed that majority of 75.93% of respondents had complete knowledge of appropriate time of sowing. Majority of the respondents lack of knowledge about the thinning and exhibited as 77.78% as incomplete knowledge.

Poor knowledge of nutrient management in maize crop was exhibited by the respondents. Majority of the respondents had partial knowledge of chemical fertilizer and organic manure to be applied in maize crop as 80.74 and 81.50% respectively. Similarly the knowledge about the micronutrient application in

maize crop exhibited incomplete knowledge of 53.70%.

Partial knowledge of irrigation in maize crop as 58.52% was expressed by the respondents. Poor knowledge of plant protection measures for maize crop was observed. It was found that 53.70% of the respondents had partial knowledge of suitable plant protection measures for maize crop whereas, 39.26% of the respondents had incomplete knowledge. The data was revealed by respondents for the weed management practices in maize crop, the 77.40% of the respondents were well aware about the manual weeding, majority of the respondents lack the knowledge about herbicide application under chemical weed control.

The extent of knowledge about the harvesting of maize crop showed the results majority of the respondents lack the appropriate harvesting of cob form maize, whereas they exhibited the sufficient knowledge about the harvesting of grain from maize crop, similarly appropriate knowledge about the adoption of maize thresher was exhibited by the respondents, about 96.67% of the respondents showed the complete knowledge about the maize threshing. Poor knowledge of maize Sheller was exhibited among the various respondents majority of the respondents of about 99.26% showed the incomplete knowledge.

Extent of adoption

Respondents are categorised in different groups on the basis of their extent of adoption for represented in Table No. 3. It is evident from the data that majority of the respondents had medium of level of adoption which was found 73.70% while 22.60% respondents had low extent of adoption. In contrary to this only 3.70% respondents had high extent of adoption for recommended practices of maize cultivation. Similar finding were reported by yadav (2014) in the study area who reported 74.17% respondents their adoption level had to medium respectively.

Table 3. Extent of Adoption of the respondents regarding recommended practices of maize cultivation (n=270)

S.N.	Category	Frequency	Percentage
1	Low (Up to 33.33%)	61	22.60
2	Medium (33.34-66.66%)	199	73.70
3	High (Above 66.66%)	10	3.70

Various recommended practices of maize cultivation are categorised and scaled on the base of their extent of adoption. Level of different recommended practices of maize cultivation are presented in Table No.4. It was observed that 35.56% of the respondents had partial adoption of technology namely selection of suitable land and only 31.48% of the respondents had complete adoption of the technology. 32.96% of respondents had no adoption for choosing suitable land for maize cultivation. The extent of adoption for selection of improved and 15.56% had complete adoption of chemical fertilizer, whereas 71.85% respondents had partial and 4.07% had adoption of organic manure. Application of varieties and seed rate was comparing high as 45.93% and 51.48% respectively, while 41.85 and 42.22% of the respondents had partial adoption for selection of improved varieties and proper seed rate, respectively. A very poor adoption of seed treatment was exhibited among all the respondents and 98.89% of the respondents had no adoption of seed treatment.

Table 4. Distribution of the respondents by their extent of adoption regarding to recommended practices of maize cultivation (n=270)

S.N	Practice	Extent of Adoption					
		Complete		Partial		Nil	
		F	%	F	%	F	%
1	**Selection of suitable land**	85	31.48	96	35.56	89	32.96
2	**Improved varieties**	124	45.93	113	41.85	33	12.22
3	**Seed Rate**	139	51.48	114	42.22	17	6.30
4	**Seed Treatment**	2	0.74	1	0.37	267	98.89
5	**Sowing Time**	149	55.19	55	20.37	66	24.44
6	**Thinning**	6	2.22	34	12.59	230	85.19
7	**Fertilizer Application**						
	Chemical Fertilizer	42	15.56	196	72.59	32	11.85
	Organic Manure	11	4.07	194	71.85	65	24.07
8	**Micronutrient**	12	4.44	42	15.56	216	80.00
9	**Weed Control**						
	Manual	183	67.78	73	27.04	14	5.19
	Chemical	9	3.33	36	13.33	225	83.33
10	**Irrigation**	55	20.37	117	43.33	98	36.30

11	**Plant Protection**	19	7.04	122	45.19	129	47.78
12	**Harvesting**						
	Cob form	6	2.22	27	10.00	237	87.78
	Grain	261	96.67	7	2.59	2	0.74
13	**Threshing**						
	Maize Sheller					270	100.00
	Maize Thresher	261	96.67	7	2.59	2	0.74

Complete adoption of right time of sowing among different respondents was found 55.19% and rest of the respondents had partial or no adoption for the technology. 85.19% of the respondents had no adoption for thinning practice in maize crop. Majority of the respondents as 72.59 and 71.85% had partial adoption for use of chemical fertilizer and organic manure, respectively while no adoption for use of micronutrient in maize crop was found 80% among different respondents.

Partial and no adoption of improved irrigation practices exhibited among the respondents as 43.33%, respectively. Poor adoption of plant protection measures was exhibited and found 47.78 and 45.19% as no adoption and partial adoption for the technology. In case of weed management contradictory results was observed. Complete adoption of manual weed management practices was exhibited among respondents as 67.78%, whereas, no adoption of chemical weeding existed as 83.33%.

The extent of adoption for harvesting and threshing exhibited the result. Majority of the respondents (96.67%) had lack the complete adoption of harvesting of maize as grain and use of thresher. Contrary to this 100% respondents had no adoption for maize Sheller while, 87.78% of respondents adopted harvesting of maize in cob form.

CONCLUSION

From the above research findings it can be concluded that majority of the respondents had medium level of knowledge and extent of adoption regarding recommended maize production technology.

REFERENCES

Bawa, D.B. and Ani, A.O. (2014). Analysis of Adoption of Improved Maize Production Technology among Farmers in Southern Borno, Nigeria. Research on Humanities and Social Sciences, 4(25): 137-141.

Chhattisgarh (2014). Annual statistics report.

CIMMYT (2005). Maize in India: production systems, constraints, and research priorities.

Gecho, Yishak and Punjabi, N.K. (2011). Determination of adoption of improved Maize technology in Damot Gale, Wolaita, Ethiopia. Raj. J. Ext. Edu., 19: 1-9.

Gupta, Km. Saroj and Gyanpur, S.R.N. (2012). Sustainability of scientific maize cultivation practice in Uttar Pradesh, India. Journal of Agricultural Technology. 8 (3): 1089-1098.

Langade, D. M., Shahi, J.P., Agrawal, V. K. and Sharma, A. (2013). Maize as emerging source of oil in india: an overview. Maydica, 58(3/4): 224-230.

Paikra, V. K. (2014). Assessment of technological gap in production of black gram among the tribal farmers of Jashpur District Chhattisgarh. M. Sc. (Ag.) Thesis, IGKV, Raipur.

R. Cox, (1956). Control of helminthosporium turcicum blight disease of sweet corn in South Florida. Phytopathology, 5: 68-70.

Reddy, T. R., Reddy, P. N., Reddy, R. R. and Reddy, S. S. (2013). Management of Turcicum leaf blight of maize, caused by Exserohilum Turcicum in maize. International Journal of scientific and Research publications, 3(10): 1-4.

Willy, V. (Undated). Soil plant growth and production Vo. II National Science foundation Flanders and geography department, Belgium: University of Ghenl . (accessed on 02/01/2013).

Yadav, S., Prajapati, R. R. and Prajapati, M.R. (2014). Knowledge and adoption of tomato growers about improved tomato production technology. Guj. J. Ext. Edu., 25(2): 172-174.