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### A study on knowledge and adoption of improved technologies in maize in East Godavari District of Andhra Pradesh

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#### Abstract

The present study was conducted during 2021-22 in East Godavari district of Andhra Pradesh. Structured interview schedule was prepared in the light of objectives and data was collected from 60 respondents selected following purposive random sampling technique. For the study ex-post facto research design was employed. Frequency, percentage, mean and standard deviation were employed for interpreting results. It was observed that 60.00 per cent had medium level of knowledge while 57.00 per cent had medium level of adoption. The reasons for non-adoption includes non-availability of high yielding varieties, availability of treated seed, perception of less dosage of fertilizer yields lower yields, not aware on type of inter crops to be grown. Farmers suggestions as against constraints includes development and make availability of high yielding Maize varieties from SAUs and to create awareness on such varieties to the farmers, arrangement of local markets, announcement of minimum support price before the commencement of crop season and procurement of produce at profitable prices, making harvesting machines available to farmers.

**Keywords:** Knowledge, adoption, reasons, suggestions

#### Introduction

Global cereal production is dominated by maize (*Zea mays* L.), one of the most significant cereal crops in the world. Maize is often referred to as the “queen of cereals” because it has the highest genetic yield potential among the cereals. The average productivity in India is 2.43 t ha<sup>-1</sup>. In India, maize is the third most important food crops after rice and wheat. India produced 33.62 million tonnes in an area of 10.04 million hectares in 2021-22, whereas in kharif 2022-23, maize production was 23.10 million tonnes in an area of 9.68 million hectares (agricoop.nic). With a production and productivity of 17.84 lakh tons and 5918 kg/ha, respectively, over an area of 3.01 lakh ha, maize was grown in Andhra Pradesh, accounting for 5.66 percent of the nation's total production (des.ap.gov.in, 2020-21). A key strategy for raising food security and improving the majority's standard of living is utilizing modern agricultural technologies to increase agricultural productivity and production. Modern technology is required to boost maize

production and productivity due to its significance to the nation's agricultural economy and family food security. However, smallholder farmers' knowledge and use of agricultural technologies in general, and improved maize varieties in particular, are limited due to numerous barriers that are either internal or external to the farmers' circumstances (Jaleta *et al.*, 2013) [5]. Increased crop yield, profitability are associated with farmers using various intensification technologies in maize, which raises household income and consumption. Using modern agricultural technologies to increase agricultural productivity and production is a crucial strategy to enhance the livelihoods of the majority and improving food security (Kaliba *et al.*, 2018) [6]. Considering Maize cultivation importance in East Godavari district a study on the impact of improved technologies on the Maize crop was conducted during the year 2021-22 with the following objectives.

1. To study the profile characteristics of Maize farmers.

2. To study extent of adoption of improved technologies on Maize in East Godavari district of Andhra Pradesh.
3. To study knowledge level of farmers on improved technologies adopted in Maize.
4. To study the reasons for non-adoption of improved technologies in Maize crop.
5. To elicit farmer’s suggestions on constraints faced in adoption of improved Technologies in Maize crop.

**Materials and Methods**

The present study was conducted during 2021-22 in East Godavari district of Andhra Pradesh. A total of 4 mandals Sitanagaram, Jaggampeta, Gandepalli and Maredumilli was selected purposively. A total of 6 villages has been selected from those mandals i.e. Chinakodepudi from Sitanagaram mandal, Katravulapalli and Jaggampeta from Jaggampeta mandal, Nayakampali and P.Surampalli from Gandepalli mandal, Thadepalli from Maredumilli mandal. 20 respondents from Chinakondepudi, 15 respondents from Katravulapalli, 10 from Jaggampeta, 10 from Gandepalli and 05 from Maredumilli has been selected following purposive random sampling technique resulting in a total sample size of 60 maize farmers. For the study *ex-post facto* research design was used.

Data was collected through personal interviews, organized, and analyzed to determine the results and draw conclusions. The analysis employed various statistical tools such as frequency distributions and percentage. The extent of adoption of recommended maize cultivation practices was assessed using the improved Maize technologies recommended by the SAUs. In cases where significant deviations from the recommended practices were observed, respondents were asked to explain their reasons for non-adoption. These reasons were then categorized and analyzed using frequencies and percentages. The results provide insights into both the adoption and knowledge of recommended practices by maize farmers, offering a comprehensive understanding of the current state of maize cultivation in the region.

**Results and Discussion**

**1. Profile characteristics of maize farmers**

It is apparent from Table 1 majority of the farmers belonged to middle age (58.00%) category followed by young age (25.00%) and old age (17.00%). Middle age farmers are good decision makers and often have wider range of networks than young age people. Majority of the farmers had primary level of education followed by illiterate (30.00%), high school (28.00%), UG (3.00%). The probable reason for 30.00 per cent farmers to be in illiterate category might be due to illiteracy of their parents, non-realization of importance of formal education.

Almost 95.00 per cent of the farmers are had farming as the occupation only 5.00 per cent of them are had both farming and business. It is also elicit from the Table 1 more than half (62.00%) of the farmers belongs to OC followed by ST (23.00%), SC (10.00%) and BC (5.00%). Nearly three fourth of the farmers had >15 years of farming experience followed by 11-15 years (22.00%), 6-10 years (7.00%).

More than half (58.00%) of the farmers had <5 ha of land followed by 5-10 ha (25.00%) and >10 ha (17.00%).

Majority 40.00 per cent of the farmers had 50,000-1, 00,000 annual income followed by <50,000 (32.00%) and 1, 00,000 (28.00%). Most of the farmers 87.00 per cent belongs to small family (up to 5 members) followed by large family (> 5 members) 13.00 per cent. Majority 85.00 per cent of the farmers belongs to nucleus type of family followed 15.00 per cent by joint type of family.

It is also depicted from Table 1 farmers obtained information from majorly from input dealers 45.00 per cent followed by other farmers (22.00%), ADA (10.00%), AO (8.00%), Scientists (7.00%), MPEOs/VAA (5.00%) and AEO (3.00%). Nearly three fourth 72.00 per cent of the farmers had no membership in the social institutions followed by 28.00 per cent of the farmers had membership in the social institutions. Majority 47.00 per cent of the farmers had extension contact rarely (47.00%) followed by frequent (33.00%) and regular (20.00%) extension contact.

**Table 1:** Profile characteristics of maize farmers

S. No	Variable	Category	Frequency	Percentage
1.	Age	<35 yrs (Young age)	15	25.00
		36-54 yrs (Middle Age)	35	58.00
		> 55yrs (Old age)	10	17.00
2.	Education	Illiterate	18	30.00
		Primary	22	37.00
		High school	17	28.00
		Inter/poly	01	2.00
		UG	02	3.00
		PG	00	0.00
3.	Occupation	Farming	53	95.00
		Farming + Business	07	5.00
4.	Caste	ST	14	23.00
		SC	06	10.00
		BC	03	5.00
		OC	37	62.00
5.	Farming Experience	< 5 years	00	0.00
		6 – 10 years	04	7.00
		11 – 15 years	13	22.00
		> 15 years	43	72.00
6.	Land holding	<5 ha	35	58.00
		5 to 10 ha	15	25.00
		> 10 ha	10	17.00
7.	Annual Income	<50,000	19	32.00
		50,000 to 1,00,000	24	40.00
		> 1,00,000	17	28.00
8.	Family size	up to 5 members	52	87.00
		>5 members	08	13.00
9.	Family type	Joint	09	15.00
		Nucleus	51	85.00
10.	Source of information	Scientists	04	7.00
		ADA	06	10.00
		AO	05	8.00
		AEO	02	3.00
		MPEOs/VAAAs	03	5.00
		Farmers/others	13	22.00
		Input dealers	27	45.00
11.	Social Participation	No Membership	43	72.00
		Membership	17	28.00
12.	Extension Contact	Rarely	28	47.00
		Frequently	20	33.00
		Regularly	12	20.00

**2. Knowledge level of farmers on improved Technologies adopted in Maize Crop**

The data presented in the Table 2 revealed that majority (97.00%) of the farmers had knowledge on recommended time of sowing, recommended Zinc deficiency management chemicals followed by recommended pests management

chemicals (92.00%), recommended weedicides (90.00%), recommended dosage of fertilizers (87.00%), recommended disease management chemicals (82.00%) and Recommended seed rate (75.00%). It is also evident that 100 per cent of the farmers had no knowledge on recommended varieties/Hybrids available with SAUs.

**Table 2:** Knowledge level of farmers on improved Technologies adopted in Maize Crop

S. No.	Improved Technologies adopted in Maize Crop	Aware		Not aware	
		Freq.	%	Freq.	%
1	Recommended varieties/Hybrids available with SAUs	00	0.0	60	100.0
2	Recommended time of sowing	58	97.0	2	3.0
3	Recommended seed rate	45	75.0	15	25.0
4	Recommended dosage of fertilizers	52	87.0	8	13.0
5	Recommended weedicides	54	90.0	6	10.0
6	Recommended Zinc deficiency management chemicals	58	97.0	2	3.0
7	Recommended pests management chemicals	55	92.0	5	8.0
8	Recommended disease management chemicals	49	82.0	11	18.0

**3. Overall knowledge level of farmers on improved Technologies in Maize**

The data furnished in the Table 3 represents the overall knowledge level of improved technologies in Maize which highlighted that majority of the famers 60.00 per cent had medium level of knowledge followed by 22.00 per cent low

level and 18.00 per cent had high level of adoption. Similar findings were supported by Netam (2018) <sup>[7]</sup> who reported 72.96% respondents had belonged to medium level of knowledge about improved technologies in Maize in the study area.

**Table 3:** Overall knowledge level of farmers on improved Technologies in Maize

S. No	Knowledge Level	Frequency	Percentage
1.	Low (<21.2)	13	22.00
2.	Medium (21.2-25.2)	36	60.00
3.	High (>25.2)	11	18.00
	Total	60	100.00
Mean = 23.2, SD = 2.0			

**4. Adoption of improved technologies in Maize by farmers in East Godavari district**

From Table 4, it can be inferred that significant proportion of farmers were following recommendations for sowing time (93.00%), pest management (90.00%), correction of zinc deficiency (85.00%), weedicides (83.00%), disease management (68.00%) and seed rate (65.00%). However all

of them were not adhering to the recommended varieties of maize related to SAUs (100.00%) and fertilizer management (100.00%). This indicates that while farmers are diligent in some aspects of maize cultivation, there are critical areas like fertilizer, management and adoption of SAUs related varieties where efforts are needed for better adherence to recommended agricultural practices.

**Table 4:** Adoption of improved technologies in Maize by farmers in East Godavari district

S. No	Improved Technologies in Maize crop	Adoption		Reasons for non-adoption
		Freq.	%	
1	Adoption of maize varieties	0	0.0	Non availability of high yielding Maize varieties from SAUs.
2	Recommended time of sowing	56	93.0	-
3	Recommended seed rate	39	65.0	Farmers perception of lower yields with recommended seed rate and seed loss due to birds and other vertebrate pests
4	Recommended fertilizers	00	0.0	Perception of less dosage of fertilizer
5	Recommended weedicides	50	83.0	-
6	Correction of zinc deficiency through recommended chemicals	51	85.0	-
7	Pest management through recommended chemicals	54	90.0	-
8	Disease management through recommended chemicals	41	68.0	Following the suggestions of input dealers and fellow farmers

The data furnished in the Table 5 represents the adoption level of improved technologies in Maize which highlighted that majority of the famers 57.00 per cent had medium level of adoption followed by 23.00 per cent medium level and 20.00 per cent had high level of adoption.

Similar findings were supported by Netam (2018) <sup>[7]</sup> who reported 73.70% respondents had belonged to medium level of adoption about improved technologies in Maize in the study area.

**Table 5:** Adoption level of improved technologies in Maize by the farmers

S. No	Adoption Level	Frequency	Percentage
1.	Low (<26.9)	14	23.00
2.	Medium (26.9- 30.7)	34	57.00
3.	High (>30.7)	12	20.00
	Total	60	100.00
Mean = 28.8 SD = 1.9			

**5. Reasons for non-adoption of improved technologies in Maize crop**

The data in the Table 6 indicates the reasons for non adoption of improved technologies in Maize that includes majority 100 per cent of the farmers revealed that Non

availability of high yielding Maize varieties/hybrids with SAUs, availability of treated seed from companies, perception of less dosage of fertilizer (97.00%), not aware on type of inter crops to be grown (92.00%). The probable reason may be that, lack of knowledge about improved practices, lack of motivation and conviction to use innovations and non-availability of critical inputs at right time. (Vikas Chowhan *et al.*, 2021) <sup>[10]</sup>. Almost (90.00%) farmers indicated the negligible incidence of disease because of which fungicide sprayings are not adopted followed by close spacing for more plant population (86.70%), more availability of water (75.00%) and perception of insufficient plant population (72.00%).

**Table 6:** Reasons for non-adoption of improved technologies in Maize crop

S. No.	Reasons	Freq.	%	Rank
1	Non availability of high yielding Maize varieties/hybrids with SAUs	60	100.0	I
2	Due to availability of treated seed from companies, seed treatment is not followed	60	100.0	I
3	Due to perception of less dosage of fertilizer, not following recommended dosage	58	97.0	II
4	Not aware on type of inter crops to be grown	55	92.0	III
5	Negligible incidence of disease because of which fungicide sprayings are not adopted	54	90.0	IV
6	Due to perception of close spacing establishes more plant population, recommended spacing is not followed	52	86.7	V
7	Due to availability of more water recommended irrigations are not followed	45	75.0	VI
8	Perception of insufficient plant population, recommended seed rate is not followed	43	72.0	VII

**6. Farmers suggestions on constraints faced in adoption of improved Technologies in Maize crop**

The data in the Table 7 reveals the farmers suggestions for the constraints faced in adoption of improved technologies in the Maize crop. From the Table 7, It is evident that majority 100.00 per cent of the farmers suggested that availability of Maize varieties to farmers, announcement of MSP before the commencement of crop season and procurement of produce at profitable prices, making

harvesting machines available to farmers ranks first position, followed by arranging local markets (97.00%, government should provide seed, fertilizers, weedicides, micronutrients, insecticides and fungicides on subsidy to farmers (92.00%), best policies to eliminate middleman in marketing system(78.30%), crop insurance for maize (75.00%) and awareness on value added products in maize(30.00%) placed in the order of second, third, fourth, fifth, and sixth rank.

**Table 7:** Farmers suggestions on constraints faced in adoption of improved Technologies in Maize crop

S. No.	Suggestions given by the farmers	Yes		Rank
		Freq.	%	
1	To make availability of high yielding Maize varieties to the farmers	60	100.0	I
2	Announcement of MSP before the commencement of crop season and procurement of produce at profitable prices	60	100.0	I
3	Making harvesting machines available to farmers	60	100.0	I
4	Arranging local markets	58	97.0	II
5	Government should provide seed, fertilizers, weedicides, micronutrients, insecticides and fungicides on subsidy to farmers	55	92.0	III
6	Best policies to eliminate middleman in marketing system	47	78.3	IV
7	Crop insurance for maize	45	75.0	V
8	Awareness on value added products in maize	18	30.0	VI

**Conclusion**

The study highlights the knowledge and adoption level of farmers regarding improved technologies in Maize crop during 2021-22 in East Godavari district of Andhra Pradesh. Farmers had knowledge on recommendations such as time of sowing, chemicals to control pests, correction of zinc deficiency through recommended chemicals, pre-emergence weedicides, short duration hybrids in maize, chemicals to control diseases. Recommendations such as sowing time, pest management, correction of zinc deficiency, weedicides, disease management and seed rate were adopted by the farmers whereas recommendations regarding fertilizer management was not adopted.

The reasons for non-adoption of improved technologies in Maize includes non-availability of Maize varieties, availability of treated seed from seed companies, perception of less dosage of fertilizer, not aware on type of inter crops to be grown, negligible incidence of disease because of which fungicide sprayings are not adopted followed by close spacing for more plant population. Majority of the farmers suggested that availability of Maize varieties to farmers, arranging local markets, announcement of minimum support price before the commencement of crop season and procurement of produce at profitable prices, making harvesting machines available to farmers, government should provide seed, fertilizers, weedicides,

micronutrients, insecticides and fungicides on subsidy to farmers can reduce the constraints faced in adoption of improved technologies.

Efforts to increase the adoption of recommended technologies should focus on educating farmers about fertilizer management, types of inter crops grown, making available of Maize varieties. Enhanced extension services, policy support, and the provision of accessible resources will be crucial in bridging the gap between current farming practices and recommended agricultural technologies.

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