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Knowledge and adoption of improve maize cultivation practices by the farmers in Purulia District of West Bengal

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Abstract

The study assessed farmers' knowledge and adoption of improved maize cultivation practices in Purulia District, West Bengal, during 2024-2025. A purposive sample of 130 farmers from eight maize-growing villages of Purulia-I and Purulia-II blocks was interviewed using a pre-tested schedule, and data were analysed with appropriate statistical tools. Results showed that 59.23% of respondents were middle-aged, 30.76% had primary education and 47.68% were engaged in agriculture with labour work. About 45.37% lived in hut-type houses, 40.76% owned less than one acre of land and 58.46% had medium annual income. More than half (52.31%) belonged to joint families. In terms of communication and psychological traits, 46.15% had low extension contact, 42.31% had medium mass media exposure, 46.15% medium social participation and 45.38% medium information sources; 47.69% showed medium scientific orientation, while risk orientation (60.76%) and progressiveness (48.46%) were mostly low. Overall, 69.23% of farmers had medium knowledge and 66.15% had medium adoption of improved maize practices. Education, occupation, housing type, landholding, income, extension contact, mass media exposure, information sources, scientific orientation and progressiveness were positively and significantly associated with knowledge and adoption, whereas age, family type and social participation were non-significant. The most severe constraint was lack of price assurance (83.08%), and the leading suggestion was provision of reliable crop insurance (84.62%) to reduce risks and enhance adoption.

Keywords: Maize cultivation, farmer knowledge, technology adoption

Introduction

Maize (*Zea mays*) is one of the world's most important cereal crops, originating from teosinte in southern Mexico where it was domesticated nearly 9,000 years ago. Since its global dissemination after the Columbian exchange, maize has become a staple food and a key raw material for feed, fodder and diverse industrial products. Owing to modern plant breeding, improvements in yield, stress tolerance and nutritional quality have significantly enhanced its global productivity, which reached 1.1 billion tonnes in 2020. The crop shows remarkable adaptability and is cultivated across a wide range of environments, from sea level to elevations of 3000 m. India, introduced to maize during the early 17th century, is currently the 5th largest producer and 14th largest exporter of maize globally (FAO, 2023). Despite its strong seed production infrastructure, favourable climate and market connectivity, India's maize exports remain limited due to high domestic demand. Maize plays a critical role as human food, animal feed and a raw material for numerous industries including starch, oil, sweeteners, alcohol, pharmaceuticals, textiles and paper (APEDA, 2023). Given its economic importance and wide utilisation, understanding farmers' knowledge and adoption of improved maize cultivation practices is essential for

enhancing productivity and ensuring sustainable production, especially in regions like Purulia, West Bengal, where the crop is grown under smallholder conditions.

Statement of the problem

Maize cultivation in Purulia District is predominantly based on traditional practices and limited adoption of modern technologies, which restricts the crop's productivity potential. Although farmers possess basic knowledge of maize cultivation, awareness and application of improved practices—such as hybrid seed use, scientific pest management and efficient irrigation—remain low. Adoption levels in the district are generally low to moderate, influenced by economic constraints, inadequate access to resources, limited extension exposure and infrastructural challenges. Recognizing these issues, the present study titled “Knowledge and Adoption of Improved Maize Cultivation Practices by Farmers in Purulia District of West Bengal” was undertaken with the following objective.

Objectives

- To find out the knowledge of the respondents about improved maize cultivation practices.

Sample design

The present study was conducted in Purulia District of West Bengal, located in the western part of the state. Geographically, Purulia lies between 22.60°-23.50° N latitude and 85.75°-86.65° E longitude, with a compass declination of 0°22' W. The district covers a total geographical area of 6,259 km². It is bordered by Bankura and Paschim Medinipur to the east, while its remaining boundaries extend towards Jharkhand and other adjoining districts.

Sources of data

The present study covers both primary and secondary data. In this direction, the researcher was collected primary data from the selected sample farmers from the selected district and interaction to the farmers and officials. The secondary were also collected from various sources like dailies, journals, reports, and books.

Results**Table 1:** Distribution of respondents based on the knowledge towards improved Maize cultivation Practices N=130

SI No	Statement	Fully known		Partially known		Not known	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1	Land preparation Power tiller Debris Removal Planking	92	70.77	27	20.76	11	8.47
2	Selection of seed variety Hybrid varieties Composite varieties	91	70.00	24	18.46	15	11.54
3	Type of soil ideal for Maize cultivation Sandy loam soil Red and Lateritic soil Well- drained soil	30	23.08	26	20.00	74	56.92
4	Soil Ph range ideal for	9	6.92	37	28.46	84	64.62
	Maize growth 5.5-6.5 6.5-7.5						
5	Soil testing	81	62.31	15	11.54	34	26.15
6	Seed treatment methods For maize cultivation Fungicide Insecticide	43	33.08	40	30.77	47	36.15
7	Intercropping Pigeon pea Cowpea	24	18.46	49	37.69	57	43.85
8	Manure used in maize cultivation Farmyard Manure Green Manure	104	80.00	22	16.92	4	3.08
9	Sowing Time for maize May to June	106	81.54	23	17.69	1	0.77
10	Sowing Method Traditional Method Seed Drills	82	63.08	40	30.77	8	6.15
11	Varieties HQPM-1 DHM117 LPCH 3	47	36.15	54	41.54	29	22.31
12	Climate 15-30 degree C	108	83.08	17	13.08	5	3.08
13	Type of fertilizers used	66	50.77	55	42.31	9	6.92
14	Type of weeding method Deep Plowing Mulching	16	12.31	42	32.31	72	55.38
15	Weed control a.) earthing up	11	8.46	45	34.62	74	56.92
16	How do determine the best Practices for plant protection Monitoring Apply neem oil Proper field sanitation	97	74.62	30	23.08	3	2.31
17	Yield/ha	90	69.23	27	20.77	13	10.00

Source: Field survey

The above table indicates that most farmers possessed adequate knowledge of basic pre-sowing operations. For land preparation, 70.77% were fully knowledgeable, and 70.00% had full knowledge of selecting suitable seed varieties. However, major gaps existed in understanding soil requirements: only 23.08% were fully aware of ideal soil types and just 6.92% knew the correct soil pH range. Knowledge of soil testing was relatively better, with 62.31% fully knowledgeable. Awareness of seed treatment was moderate (33.08% fully knowledgeable), and intercropping knowledge remained low, as 43.85% lacked awareness. Use of organic manures was well understood by 80.00% of farmers. Knowledge of sowing time was strong (81.54% fully knowledgeable), while understanding of sowing methods was moderate (63.08% fully knowledgeable). Awareness of recommended hybrids and varieties was mixed, with only 36.15% fully knowledgeable. Climate suitability was well understood by 83.08% of respondents. Knowledge of fertilizer use was moderate (50.77% fully knowledgeable). Major knowledge gaps were observed in weeding methods and weed-control practices, with more than half of the farmers unaware of recommended techniques. In contrast, knowledge of plant protection practices was comparatively high, with 74.62% being fully knowledgeable. Finally, 69.23% of respondents were fully aware of their yield per hectare.

Table 2: Overall distribution of the respondents based on knowledge level towards Mize cultivation practices N=130

SI No	Category	Frequency	Percentage
1	Low (26-32)	19	14.62
2	Medium (33-42)	90	69.23
3	High (43-48)	21	16.15
		130	99.99

Source: Field Survey

Conclusion

It is concluded that majority (69.23%) of the respondents have medium level of knowledge about maize cultivations followed by 16.15 per cent of the respondents have high level of knowledge and 14.62 per cent of the respondents have low level of knowledge toward maize cultivations.

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