



Awareness and Brand Preferences of Farmers for Hybrid Tomato Seeds in Latehar District of Jharkhand

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ABSTRACT: The agricultural sector plays a crucial role in the country's economy, with a significant portion of the population dependent on farming for their livelihood. Among various crops, tomatoes hold substantial economic importance due to their high demand and profitability. However, adoption of hybrid tomato seeds remains a challenge for many farmers, particularly in regions like Latehar district of Jharkhand, where traditional farming practices dominate. The present empirical research study seeks to explore the awareness and brand preference of farmers in Latehar district towards hybrid tomato seeds. The study aims to address several critical issues, including awareness, brand preference, and the overall buying behaviour of tomato growing farmers by using a descriptive cross sectional research design. The study also unearths the key constraints perceived by farmers in adopting hybrid seeds, providing insights into the barriers that need to be overcome. Employing a multi-stage sampling technique, respondents were carefully selected to ensure a representative sample of the tomato-growing farmer population in the district. The result indicates that the farmers are aware about the hybrid tomato seeds as well as few of the brands. Factors like 'High yield compared to another brand' and 'Quality of fruit compared to other brands' came out to be the most influencing factors; followed by "Resistant to seed borer" and "Dealers' influence on brand" with third and fourth rank respectively. The least influencing two factors were found to be 'Attractive package and unit size' and 'Availability on credit'. Major constraints were found to be 'Market accesses' to sell the produce, 'Infrastructure' like irrigation facility and value addition facility for the produce after harvest and the 'Perceived risk' of climate (untimely rain and hail stones) as well as the diseases.

Keywords: Awareness, Brand preference, Buying behaviour, Constraints, High yield, Hybrid seeds, Market access, Perceived risk, Tomato.

INTRODUCTION

Agriculture sustains 58% of India's population and is crucial for GDP, alongside fisheries and forestry (FAO, 2021). Horticulture a sub-branch of agriculture, contributes about 33% to the agriculture Gross Value Added (GVA) making very significant contribution to the Indian economy. Apart from ensuring nutritional security of the nation, it provides alternate rural employment opportunities, diversification in farm activities, and enhanced income to farmers. Horticulture encompasses vegetables, fruits, spices, flowers, medicinal, and aromatic crops. Vegetables provide nutrition, economic security, high returns, and improved livelihoods. India is the second largest vegetable producer (MoAFW, 2022). The growth of this sector is driven by high-quality inputs, technology, and polyhouse production, particularly in Asia (Federation of Seed Industry of India, 2019). In India major producers of vegetables are West Bengal, Bihar,

Uttar Pradesh, Andhra Pradesh and more. In 2022-23, 827,288 MT of vegetables worth Rs. 2,443 crores were exported from the country. In the year 2023-24, the production was 209.39 million tonnes in 11.24 million Ha area, (APEDA, 2024). Seed is the most crucial input among all agricultural inputs, initiating the cycle of agricultural production and agro-industry. Without high-quality seeds, the impact of other inputs like fertilizers and pesticides on crop yield will be limited. Therefore, to enhance productivity levels in crops, having "good quality seed is essential." In India, there are currently around 200 private seed enterprises. Both public and private sector organisations play an important role in fostering the growth of the vegetable seed business and vegetable production. The private seed sector comprises a few large players, several medium companies and many small players with a local presence. With their major concentration on biotechnology, the most significant international seed firms now have a presence in India (either as a joint

venture or with 100 per cent equity). The major players in the Indian vegetable seed industry are Nunhems (a subsidiary of BASF), Seminis (a subsidiary of Bayer), Syngenta (Switzerland-based MNC), and Namdhari Seeds, Mahyco Seeds, Krishidhan Seeds, Nuziveedu Seeds, Rasi seeds and others. Globally tomato production is profitable business due to the high demand and multiple harvests. China is the largest producer of tomato producing 36% of global output. In India 0.78 million ha is cultivated and 19.75 million metric tonnes produced annually. The top tomato producing states are Andhra Pradesh, Madhya Pradesh, Karnataka. In Jharkhand the annual production is 400,000 to 450,000 metric tonnes. The introduction of high-yielding hybrid tomato varieties has significantly impacted the tomato industry in India. These hybrids have contributed to increased productivity, higher farmer incomes, and improved market supply. The availability of disease-resistant varieties has also reduced crop losses and minimized the dependence on pesticides, promoting more environmentally friendly agricultural practices.

LITERATURE REVIEW

The literature review summarizes findings from various research studies related to this topic. It helps identify existing knowledge about the research problem and highlights areas that require further investigation. Key relevant studies are summarized below.

Sajjan & Kerur (2018) identified the key determinants of brand preference such as seed quality, yield potential, pest and disease resistance, and availability for cotton hybrid seeds. The findings suggested that established seed brands with a reputation for high-quality products and reliable performance were mostly preferred by farmers. The study also highlighted the importance of effective marketing and distribution strategies in shaping farmers' brand preferences.

Oraon *et al.* (2018) reported the key constraints as lack of knowledge about improved varieties, high cost of inputs, inadequate irrigation facilities, lack of technical guidance, and limited access to credit.

Hussain *et al.* (2020) found a positive relationship between brand loyalty and brand preference for chilli seeds among farmers. In their opinion, brands are highly valuable assets, and brand preference reflects customer allegiance, successful marketing campaigns, and brand strength.

Mantrabuddi *et al.* (2021) found that factors such as yield potential, resistance to pests and diseases, brand reputation, price, and availability of the seeds were the primary determinants of farmers' buying behaviour towards tomato seeds. The findings suggested that seed companies and policymakers should focus on developing high-yielding and disease-resistant tomato seed varieties, maintaining a strong brand reputation, and ensuring the availability of seeds at competitive prices to better cater to the needs of the farming community.

Sindhuja *et al.* (2022) studied and revealed that most farmers purchased hybrid vegetable seeds from private retail outlets and preferred cash over credit for their

purchases. The study also identified yield, price, quality, pest and disease resistance, and agro-climatic adaptability as the major factors influencing farmers' buying behaviour. The results were statistically significant, and the study concluded that understanding farmers' buying behaviour can help in filling the gap between their needs and the products offered in the market.

Kumar & Masih (2023) provided a comprehensive analysis of the market share and factors influencing seed demand for tomato seeds. The study revealed that hybrid seeds were the most popular followed by Syngenta, Shanker, Kalash, Kaveri, Krishidhan, Nuziveedu, and Rasi seeds. Key factors affecting demand included seed quality, availability of fertilizers and agro-chemicals, access to credit facilities, and the use of modern agricultural machinery. The study also highlighted challenges in the tomato seed marketing system, such as high commission charges and limited access to market information.

METHODOLOGY

This study describes the awareness and brand preferences of farmers for hybrid tomato seeds in Latehar district of Jharkhand.

Research Design. In this project, 250 farmers from five blocks of Latehar district in Jharkhand were taken under study. Descriptive cross sectional research design was chosen for its suitability in obtaining a clear picture of the status of a phenomenon and in gathering detailed information that describes the existing conditions and practices.

Data Collection

1. Primary data: The study is predominantly based on primary data. Primary data were collected from tomato growing farmers of Latehar district of Jharkhand with the help of structured interview schedule.

2. Secondary data: Secondary data were also utilized for the study, which involved an extensive literature review, analysis of annual reports from various Government and Non-Government organizations, examination of previous research studies, and collection of relevant secondary data from published reports of government departments, research papers, newspapers, books, and internet sources. Secondary data were sourced from various books, articles, journals, periodicals, other published and unpublished sources, as well as electronic databases and internet resources.

Sampling procedure & sample size. In this study, 250 tomato growing farmers were selected through multi stages sampling method. In the first stage, Latehar district was selected purposively as it had more no. of tomato growing farmers with its suitable climatic conditions for growing tomatoes. In the second stage, out of nine blocks of Latehar district, five blocks were selected randomly. In the third stage, five villages from each block were selected randomly. Finally, in the fourth stage, 10 farmers from each village were selected randomly; making the total sample size of 250 farmers.

RESULTS AND DISCUSSION

Socio Economic characteristic of Farmers. Based on the frequency analysis of the responses of 250 respondents, as shown in Table 1, socio economic characteristics of respondents –tomato growing farmers- were classified according to their gender, age, land holding size, education status, annual family income and occupation. Out of 250 respondents, majority (71.60%) of the respondents were male and only 28.40 per cent respondents were female. Most of the respondents 33.20 per cent fell within the 31-40 years age group. Additionally, about 29.60 per cent of respondents fell within the 41-50 years age group. Only 22.80 per cent respondents between 21-30 years old while 14.40 per cent of respondents were above 50 years old, while there were. Most of the respondents comprising 44.00 per cent belong to Marginal (up to 1 ha) and 35.60 belong to small (1.01-2 ha) category

based on the land holding size. 11.60 per cent respondents are semi medium (2.01-4 ha) and 8.80 per cent are medium (4.01- 10.00). 48.80 per cent respondents have completed their study up to secondary school, 25.20 per cent and 24.40 per cent have completed primary school and graduation respectively. Only 1.60 respondents are postgraduates. 36.67 per cent respondents have their annual family income up to ₹ 1, 00,000 and 32.67 per cent have their annual family income between ₹ 1, 00,001 to ₹ 3, 00,000. 15.33 per cent respondents have their family income between ₹ 3, 00,001 to ₹ 5,00,000 and only 8.67 per cent having annual family income above ₹ 5,00,000. 56.40 per cent respondents practice farming along with animal husbandry and 19.60 per cent respondents practice farming only as their main occupation. 13.20 per cent does Farming & business and 10.80 per cent does Farming & business.

Table 1: Socio economic characteristic of respondents (n = 250).

Variables	Parameters	Frequency	Percentage
Gender	Male	179	71.60
	Female	71	28.40
Age of respondents	21-30 years	57	22.80
	31-40 years	83	33.20
	41-50 years	74	29.60
	Above 50 years	36	14.40
Land holding size	Marginal (up to 1 ha)	110	44.00
	Small (1.01-2 ha)	89	35.60
	Semi Medium (2.01-4 ha)	29	11.60
	Medium (4.01-10 ha)	22	8.80
	Large (>10 ha)	00	00.00
Education status	Primary School	63	25.20
	Secondary School	122	48.80
	Graduate	61	24.40
	Postgraduate	4	1.60
Annual family income	up to 1,00,000 ₹	110	36.67
	1,00,001 to 3,00,000 ₹	98	32.67
	3,00,001 to 5,00,000 ₹	46	15.33
	Above 5,00,000 ₹	26	8.67
Occupation	Farming only	49	19.60
	Farming & Animal husbandry	141	56.40
	Farming & Service	27	10.80
	Farming & Business	33	13.20

Awareness among farmers for hybrid tomato seeds.

It is seen that 100 % of the respondents are fully aware and familiar with hybrid tomato seeds. It is seen that 50% of the respondents get information regarding the seed varieties from the seed companies in the form of field demonstrations, farmer meetings, and advertisements. 26% get the information from fellow farmers, 14 % from Agricultural Extension services and rest of the 10 % get the information from other sources like electronic media. All the 250 respondents have grown hybrid tomato in the past.44% of the respondents have been growing hybrid tomatoes for more than 10 years, and 35 % have 5-10 years of experience of growing hybrid tomatoes, 18% have experience in between 2-5 years and the remaining 3 percent have

less than 2 years of experience. In the results it is found out that 100% of the farmers are aware of a total of three brands from the below list i.e. Seminis, Syngenta and Nunhems. More than 90% are aware of Namdhari (97%), and VNR seeds (94%). Very few respondents are aware of Seed brands like Akshay seeds (13.6%), Shatabdi Seeds (17%) & Bombay Super Hybrid Seeds (only 2%). It is seen that 100% of respondents have used Syngenta, and more than 90% of respondents have used Nunhems (97%), Seminis (96.4%) and Namdhari (93.6%). VNR (75%) & Dhanya (60.4%) are also quite popular among farmers in some areas. Bombay Super Hybrid Seeds have no existence in Jharkhand state hence none of the respondents have used this brand in the past.

Table 2: Brands known to respondents and its usage (n = 250).

Sr. No.	Brand Name/Company	Percentage	
		Awareness	Usage
1.	Seminis	100	96.4
2.	Namdhari	97.2	93.6
3.	Syngenta	100	100
4.	Dhanya	66.8	60.4
5.	VNR Seeds	94.8	75.6
6.	Solar Seeds	58	9.2
7.	Bio Seeds	29.6	5.2
8.	Nunhems	100	97.2
9.	IndoSem	49.2	47.6
10.	Shatabdi seeds	17.2	2
11.	Akshay seeds	13.6	1.2
12.	Bombay Super Hybrid seeds	2	0
13.	Others	0	0

Factors Influencing the Brand Preference of Hybrid Tomato Seeds

Analytical technique employed:

Garrett's Ranking Technique: To study the factors influencing brand preference of hybrid tomato seeds

Garrett ranking technique was adopted (Garrett & Woodworth 1926).

To know the brand preference of hybrid tomato seeds in the study area 10 factors were selected

Table 3: List of factors influencing brand preference for hybrid tomato seeds and their ranks.

Sr. No.	Factors	Mean	Rank
1.	High yield compared to another brands	66.336	I
2.	Quality of fruit compared to other brands	66.332	II
3.	Resistant to seed borer	65.648	III
4.	Dealers' influence	57.392	IV
5.	Availability	51.192	V
6.	Influence of advertisement	42.04	VI
7.	Progressive farmers/friends' influence	41.164	VII
8.	Price	41.108	VIII
9.	Availability on credit	36.776	IX
10.	Attractive package and unit size	32.012	X

Considering above factors (Table 3), it has been concluded that which factor is more influencing while choosing a brand to purchase.

Step I: Ranking given by 250 respondents for each factor was calculated-

Step II : Assigned ranks has been converted into percent position value using the formula

$$\text{Percent position value} = \frac{100(R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij} = Rank given for the i th item by the j th individual.

N_j = Number of items ranked by j th individual.

The per cent position value for the same assigned ranks and their Garret score are as follows

E.g.: Garrett's Table scores for the percent position values given in Table

Step IV: Ranks given by the total no. of respondents to each factor is calculated. Summation of the Garrett scores for each factor was worked out for the number of respondents who ranked for each factor & Mean scores were calculated by dividing the total score by the number of respondents. As shown in Table

Step V: Overall ranking was obtained by assigning ranks I, II, III.... X etc. in the descending order of the mean score.

In the results after analysis, it is seen that factors "High yield compared to another brands" and "Quality of fruit compared to other brands" are the two most influencing factors with mean score 66.34 & 66.33 respectively. After that, factors like the variety being resistant to seed borer, dealers' influence on brand and seeds availability comes as rank 3, 4 and 5 with the mean score of 65.65,

Table 4: Ranks' Percent Position value and its Garrett score.

Rank	Percent position value	Garrett Score
1	5	82
2	15	70
3	25	63
4	35	58
5	45	52
6	55	48
7	65	42
8	75	37
9	85	30
10	95	18

Step III: For each per cent position value, scores were obtained with reference to Garrett's Ranking Conversion Table and each per cent position value was converted into scores by reference to Garrett's Table.

57.39 & 51.19 respectively. Factors like Attractive package and unit size, Availability on credit & Price being less are found to have the least influence in the purchase decision of farmers.

CONCLUSIONS

The study on "Awareness and Brand Preference of Farmers for Hybrid Tomato Seeds in Latehar District of Jharkhand" provides critical insights into the factors influencing hybrid tomato seed adoption by the farmers. The research highlights the importance of socio-economic characteristics, awareness levels, brand preferences, and various determinants of purchasing decisions among farmers in the region. The findings indicate that farmers are well-informed about hybrid tomato seeds, showing strong brand loyalty to well-known seed brands such as Syngenta, Nunhems, Seminis, and Namdhari. Key factors influencing their purchasing decisions include high yield, quality of fruit, resistance to pests and diseases, and dealer influence. Addressing the constraints related to market access and infrastructure can further enhance the adoption and satisfaction levels of farmers. By implementing targeted marketing campaigns, conducting field demonstrations, forming collaborations, emphasizing high yield and quality, and providing robust customer support and loyalty programs, seed companies can significantly improve their market presence and farmer satisfaction. This study serves as a valuable foundation for understanding the hybrid tomato seed market dynamics in Latehar district and provides actionable recommendations for seed companies and policymakers to foster sustainable agricultural growth and productivity.

RECOMMENDATIONS

1. In terms of awareness and usage in the study region, the companies with low presence or which are totally non-existent, it is recommended to develop targeted marketing campaigns to raise awareness about the companies. They should utilize local media channels, social media, and agricultural fairs to reach a wider audience. They should also conduct regular field demonstrations and farmer meetings to showcase the benefits and performance of seeds, as these can significantly influence farmers' seed choices.
2. Companies should focus on partnering with established agricultural extension services to provide information and training to farmers. These collaborations can help in gaining credibility and trust among farmers. Encourage satisfied farmers to share their positive experiences with others. Word-of-mouth recommendations from fellow farmers can be highly persuasive.
3. As high yield compared to another brands and quality of fruit compared to other brands are found to be the two most influencing factors, companies need to remain quality conscious and also propagate the positive

effects of their products to farmers through farmer meetings.

4. Resistance to pests and diseases is also found to be the third most influencing factor for purchase of hybrid tomato. So, the companies should highlight the resistance of their seeds to common pests and diseases, such as seed borers. This can be a crucial factor for farmers when choosing seeds.

5. Dealers' influence has been ranked as the fourth most influencing factor for making a purchase decision. Hence dealer-oriented sales promotion initiatives should be taken by the companies.

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