**Original Research Article**

**FARMER’S AWARENESS AND BUYING BEHAVIOUR OF FUNGICIDE (Carbendazim 12% and Mancozeb 63% WP) FOR CUMIN CROP IN SELECTED TALUKAS OF SURENDRANAGAR DISTRICT, GUJARAT**

**Abstract:** Agricultural development has been essential to human civilization, with pesticides fourth-largest pesticide producer, India accounts for only 3.75 percent of global pesticide usage, with insecticides being the most commonly used. This study, titled “Farmer’s Awareness and Buying Behaviour of Fungicide (Carbendazim 12% and Mancozeb 63% WP) for Cumin Crop in Selected Talukas of Surendranagar District, Gujarat”, was conducted from January 26 to March 26, 2025, to understand farmers' socio-economic profiles, awareness, satisfaction and buying behaviour. Using a descriptive research design and purposive sampling, data was collected from 180 cumin farmers across Wadhwan, Muli, and Dasada talukas. Findings revealed that most respondents were middle-aged males with low education levels and small landholdings. Brand image and agro-service center recommendations significantly influenced purchasing decisions, while awareness of specific fungicides like Sapath was limited. Farmers expressed moderate satisfaction, particularly with product availability, and found farmer meetings and social media to be the most effective promotional tools. The study emphasizes the need for targeted awareness initiatives and enhanced product quality to support better adoption and informed decision-making among cumin growers.

**Keywords:** Pesticide, Fungicide, Sapath, Farmer awareness, Promotional tools, Buying behaviour.

**1. Introduction**

Agricultural development has a very rich history across various regions of the world. Around 10,000 years ago, farming practices first emerged in the fertile crescent of Mesopotamia, which includes present-day Iraq, Turkey, Syria, and Jordan. Early inhabitants of these areas gathered edible seeds using methods like fire-stick farming and forest gardening. As communities transitioned to a more settled lifestyle on farms, they began cultivating significant amounts of wheat, barley, peas, lentils, chickpeas, bitter vetch, and flax. In the Sahel region of Africa, rice and sorghum were domesticated approximately 7,500 years ago. Agriculture is one of the most important sector of indian economy. This sector occupied almost 47 percent geographical area of india. In india, more than 70 percent household depends on agriculture sector. In 1950-51, agriculture sector provided 76 percent employment, while in 2012-13, it decreases to 52 percent. Agriculture has always been an important sector for india, because it is the main exports from the country and also supports other industries such as Textile industry (e.x. Cotton) and Sugarcane derivatives (e.x. Sugar) (Sharma *et al*. 2018 and Jain *et al.* 2023). With limited land and a rapidly growing population, increasing agricultural productivity is essential. Solutions include soil-less farming methods like hydroponics or increased use of chemical inputs. Today, crops often face pests, diseases, and weeds. Without pesticides, production losses in fruits, vegetables, and cereals could reach up to 78, 54, and 32 percent respectively, making pesticide use crucial in modern farming (Tudi *et al*. 2021).

Pesticides play a vital role in agriculture by reducing crop losses and improving yield quality. Their use dates back to ancient civilizations, evolving from natural compounds to modern synthetic chemicals. Pesticides are mainly classified into herbicides, insecticides, fungicides, and rodenticides, each targeting specific threats to crops. Herbicides control weeds and have grown rapidly in use, especially in India, due to labor shortages. Insecticides manage harmful insects and are available in various chemical forms. Rodenticides helps to control crop-damaging rodents, while fungicides combat fungal diseases and account for a large share of the global pesticide market. Despite their benefits, pesticides also pose environmental risks, making responsible use essential (Saini and Sharma, 2019).

According to Assad and co-workers (2021), 7 million tons of chemical pesticides are produced globally each year, with 4.6 million tons applied. Europe accounts for 45 percent of usage, the USA 24 percent, and India only 3.75 percent. Herbicides dominate the global pesticide market (50%), followed by fungicides (22.5%) and insecticides (20.4%) (Reddy *et al*., 2024). In 2020, the U.S. and Brazil were the top consumers. Global pesticide sales are projected to grow by 5.5 percent annually through 2031 (Salceanu *et al*., 2022). India began pesticide production in 1952 with BHC. Today, it ranks 4th in global production but 12th in usage, contributing just 1 percent of global consumption. Insecticides are the most used type. Maharashtra and Uttar Pradesh lead in national consumption, together using 41 percent of India's pesticides (Nayak & Solanki, 2021). The study aimed to assess farmers’ awareness and buying behavior toward the company’s product, evaluate market conditions and competitors, measure farmer satisfaction, and increase product awareness in the region.

* 1. **Objectives**

1. To study Socio-economic profile of farmers
2. To determine the factors Influencing Farmer’s Buying behaviour
3. To study Farmer’s awareness and Satisfaction level
4. To identify the effective promotional activities for farmers

**2. Materials and Methods**

The study employed a structured interview schedule to gather data aligned with its objectives. It was conducted in selected villages of Surendranagar district, using primary data from farmers and secondary data from literature, publications, and websites. A descriptive research approach was adopted to explore key aspects of cumin farming. Using non-probability convenience sampling, 180 cumin farmers were surveyed over 60 days. Data were analyzed through tabular methods and statistical tools such as Weighted Average Mean and Garret Score (Nemoto and Beglar, 2014, Guh *et al*. 2008 & Christy, 2014).

**3. Result and Discussion**

**3.1 To study Socio-economic profile of farmers**

Table 1. Socio-economic profile of farmers

|  |  |  |  |
| --- | --- | --- | --- |
| Sr. No. | Particulars | Respondents | Percentage |
| 1 | **Age** | | |
| <25 | 0 | 0 |
| 26-35 | 12 | 7 |
| 36-45 | 69 | 38 |
| 46-55 | 66 | 37 |
| >55 | 33 | 18 |
| Total | 180 | 100 |
| 2 | **Education** | | |
| Illiterate | 48 | 27 |
| Up to primary | 78 | 43 |
| SSC | 36 | 20 |
| HSC | 12 | 7 |
| UG/PG | 6 | 3 |
| Total | 180 | 100 |
| 3 | **Gender** | | |
| Male | 180 | 100 |
| Female | 0 | 0 |
| Total | 180 | 100 |
| 4 | **Landholding** | | |
| <1 | 18 | 10 |
| 1-2 | 120 | 67 |
| 2.1-4 | 39 | 22 |
| >4 | 3 | 1 |
| Total | 180 | 100 |
| 5 | **Area under cumin** | | |
| <1 | 82 | 46 |
| 1-2 | 81 | 45 |
| 2.1-4 | 15 | 8 |
| >4 | 2 | 1 |
| Total | 180 | 100 |
| 6 | **Annual income** | | |
| <1 | 12 | 7 |
| 1-3 | 93 | 51 |
| 3.1-5 | 75 | 42 |
| 5.1-10 | 0 | 0 |
| >10 | 0 | 0 |
| Total | 180 | 100 |
| 7 | **Family size** | | |
| 2 | 3 | 2 |
| 3-5 | 117 | 65 |
| >5 | 60 | 33 |
| Total | 180 | 100 |
| 8 | **Major Disease** | | |
| Alternaria Blight | 99 | 55 |
| Wilt | 63 | 35 |
| Powdery mildew | 18 | 10 |
| Total | 180 | 100 |
| 9 | **Method of control** | | |
| Cultural | 51 | 28 |
| Chemical | 180 | 100 |
| Sanitation | 18 | 10 |
| Exclusion | 15 | 8 |
| Other | 0 | 0 |
| Total | 180 | 100 |

The study surveyed 180 farmers, revealing that most were aged between 36–55 years, with only 7 percent under 35 and none under 25. Education levels showed 43 percent had primary education, 27 percent were illiterate, and only 3 percent had UG/PG education. All respondents were male.

Most farmers (67%) owned 1–2 hectares of land, with very few having more than 4 hectares. Similarly, 91 percent cultivated cumin on less than 2 hectares. In terms of income, 51 percent earned ₹ 1–3 lakh annually, and 42 percent earned ₹ 3.1–5 lakh. Family size ranged mostly between 3–5 members (65%), with only 2 percent having a 2-member family.

Alternaria blight was the most reported cumin disease (55%), followed by wilt (35%) and powdery mildew (10%). For disease control, all farmers used chemical methods; 28 percent used both chemical and cultural practices, and some also practiced sanitation or exclusion.

**3.2 To determine the factors Influencing Farmer’s Buying behaviour**

Table 2. Factors influencing Buying behaviour of farmers

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sr. No. | Factors | MI | I | N | SI | LI | Total | WAM | Rank |
| 1 | Brand Image | 96 | 38 | 29 | 13 | 4 | 180 | 4.16 | 1 |
| 2 | Recommendation by Agro-Service Centre | 93 | 36 | 31 | 15 | 5 | 180 | 4.09 | 2 |
| 3 | Quality | 91 | 35 | 33 | 16 | 5 | 180 | 4.06 | 3 |
| 4 | Recommendation by Farmers | 89 | 40 | 30 | 14 | 7 | 180 | 4.05 | 4 |
| 5 | Performance of product | 83 | 41 | 33 | 17 | 6 | 180 | 3.98 | 5 |
| 6 | Past experience | 85 | 36 | 38 | 14 | 7 | 180 | 3.96 | 6 |
| 7 | Timely availability | 77 | 35 | 42 | 19 | 7 | 180 | 3.86 | 7 |
| 8 | Price | 76 | 33 | 43 | 20 | 8 | 180 | 3.82 | 8 |
| 9 | Demonstration | 68 | 30 | 52 | 19 | 11 | 180 | 3.69 | 9 |
| 10 | Advertisement | 65 | 33 | 49 | 21 | 12 | 180 | 3.65 | 10 |
| 11 | Packaging size | 51 | 35 | 51 | 28 | 15 | 180 | 3.43 | 11 |
| 12 | Credit facilities | 44 | 33 | 53 | 31 | 19 | 180 | 3.28 | 12 |

(MI = Most important, I = Important, N = Neutral, SI = Slightly important, LI = Least important)

(Nemoto and Beglar, 2014 & Guh *et al*. 2008)

Study highlights the factors influencing farmers' pesticide purchasing decisions. Responses were grouped into five categories: Most Important, Important, Neutral, Slightly Important, and Least Important. Key factors considered include Brand Image, Farmer Recommendations, Agro-Service Center Advice, Price, and Product Performance. The importance of each factor was determined using the Weighted Average Mean (WAM).

The analysis revealed that Brand Image ranked as the top influencing factor (WAM 4.16), followed by agro-service center recommendations (4.09), product quality (4.06), and recommendations from fellow farmers (4.05). Product performance and previous experience also played significant roles. Credit facilities, however, were rated the least influential.

* 1. **To study Farmer’s awareness and Satisfaction level**

Table 3. Farmer awareness regarding company and product

|  |  |  |  |
| --- | --- | --- | --- |
| Sr. No. | Particulars | Respondents | Percentage |
| 1 | **Heard about company ?** | | |
| Yes | 43 | 24 |
| No | 137 | 76 |
| Total | 180 | 100 |
| 2 | **Level of awareness regarding product** | | |
| Highly aware | 6 | 4 |
| Aware | 33 | 18 |
| Moderately aware | 33 | 18 |
| Slightly aware | 42 | 23 |
| Not aware at all | 66 | 37 |
| Total | 180 | 100 |

Table 4. Satisfaction level of farmers

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sr. No. | Factors | HS | S | N | DS | HD | Total | WAM |
| 1 | Price | 24 | 30 | 111 | 6 | 9 | 180 | 3.3 |
| 2 | Yield | 9 | 39 | 105 | 18 | 9 | 180 | 3.11 |
| 3 | Performance | 9 | 33 | 105 | 24 | 9 | 180 | 3.05 |
| 4 | Availability | 27 | 33 | 96 | 18 | 6 | 180 | 3.31 |
| 5 | Quality | 6 | 33 | 102 | 27 | 12 | 180 | 2.96 |

(HS = Highly satisfied, S = Satisfied, N = Neutral, DS = Dissatisfied, HD = Highly dissatisfied)

(Nemoto and Beglar, 2014 & Guh *et al*. 2008)

Third objective highlight the awareness and satisfaction levels of farmers regarding the company and its product, Sapath fungicide.Finding reveals that a significant majority of farmers (76%) are unaware of the company, while only 24 percent (43 out of 180) have awareness. Results further shows limited awareness about the Sapath fungicide specifically, 37 percent of farmers are not well aware of it, only 4 percent are highly aware, and the remaining are either moderately aware or somewhat familiar. This indicates a need for improved outreach and promotional efforts by the company. It further evaluates farmer satisfaction using Weighted Average Mean (WAM). The highest satisfaction was reported for product availability (WAM 3.31), followed closely by price (3.30). However, product quality received the lowest satisfaction score, suggesting that while accessibility and affordability are strengths, quality perception needs improvement.These findings underscore the importance of increasing product awareness and enhancing quality to boost overall.

* 1. **To identify the effective promotional activities for farmers**

Table 5. Promotional activities for farmers

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sr. No. | Factors | Garret score | Mean | Rank |
| 1 | Farmer meeting | 80 | 64.95 | 1 |
| 2 | Social media advertisement | 67 | 62.18 | 2 |
| 3 | Field demonstration | 60 | 60.21 | 3 |
| 4 | T.V. advertisement | 53 | 56.17 | 4 |
| 5 | Leaflet | 47 | 55.60 | 5 |
| 6 | Poster | 40 | 54.55 | 6 |
| 7 | Exhibition | 32 | 46.54 | 7 |
| 8 | Wall painting | 20 | 43.4 | 8 |

(Christy, 2014)

Fourth objective highlight the promotional activities that most influence farmers and provide insights for shaping future marketing strategies. Eight different promotional methods were ranked based on how farmers rated their effectiveness, from Rank 1 (most effective) to Rank 8 (least effective).It further analyzes these responses using mean values and Garrett ranking. The findings show that farmer meetings are the most impactful promotional tool (mean score: 64.95), followed by social media advertisements (62.18) and field demonstrations (60.21). Traditional methods like TV ads, leaflets, and posters had moderate influence, while exhibitions and wall paintings were rated the least effective.This suggests that direct, interactive promotions such as meetings and field demonstrations resonate best with farmers in the study area. The company should prioritize these methods in its future outreach plans to improve engagement and product visibility.

1. **Conclusion**

The study highlights that most cumin farmers in Surendranagar are middle-aged, male, and have limited formal education, influencing their decision-making and purchasing behaviour. Small landholdings are common, with the majority earning between ₹1-5 lakh annually. Farmers rely heavily on chemical methods for disease control, particularly against Alternaria blight and wilt. Brand image, agro-service center recommendations, and product performance play key roles in pesticide selection, while credit facilities have minimal impact. Awareness of the company and its fungicide is low, indicating a need for better outreach. Farmers are most satisfied with product availability and price, but quality remains a concern. Promotional strategies like farmer meetings and social media advertisements are most effective.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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