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Farmers' Purchasing Behaviour of Corteva Agriscience's Products (Galileo Sensa and Delegate) for Chilli in Umreth Taluka of Anand District, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Agriculture is the backbone of the Indian economy. Majority of Indian people live in rural areas and dependent on agriculture directly or indirectly. For cultivating crops on the farm, producers must need different inputs like seeds, fertilizers, pesticides, etc. to be used on their farm. During crop season different factors (diseases, pests, climate) are affecting crop yield. As a result,

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proper agrochemical application must begin at the grass root level. The agrochemicals industry is highly competitive due to the presence of several multinational companies [1].
Methods: The research adopts a non-probability convenient sampling method to gather data from 150 farmers in the target area. Collected datawas analyzed using various analytical tools, including tabular analysis, Garrett's Ranking technique, Graphical presentation, and Weighted Arithmetic Mean.
Finding: The findings of this research revealed that, factors influencing the purchase of both products were identified as quality, best result, and crop growth. Farmers' perception about Galileo Sensa as a product that offered a price matching its quality and safety for chilli, farmers, and soil. Similarly, farmers perceived Delegate as safe for chilli, with a price matching its quality and safety for farmers and soil. Farmer meetings emerged as the most important promotional tool for both products. However, the main problems faced by farmers during the purchasing process includes the unavailability of preferred brands, lack of credit availability, and relatively high prices.

Keywords: Farmers; purchasing behavior; chilli; factors; perception; perceptual/positioning map; promotional tools; problem.

1. INTRODUCTION

India is an agrarian nation where more than 50 percent of the population depends on agriculture for living. It is the world's largest producer of spices, pulses, milk, tea, cashew, and jute and ranks second in the production of wheat, rice, fruits and vegetables, sugarcane, cotton, and oilseed crops [2].

India makes up 16.7 per cent of the global population and 2.4 percent of the world's land area. India is the second-most populated nation in the world and the seventh-largest country by land area. It has a total area of 329 million hectares, of which 143 million hectares are arable land. Demand for food production is expanding along with the population's sharp increase [3-6]. We must place more emphasis on agriculture and the agri-input industry in order to improve production, as well as on factors like quality, a fair price, easy credit, the purchase of farm products, and how extension services are delivered. As a result, boosting the productivity of all the crops on the already used agricultural area would be necessary to produce more food grains. This requires appropriate integrated management of all inputs, including fertiliser and pesticides. Increased productivity and output help to cut down on food grain losses during the crop production phases. This is made possible by effective weed and pest control [7].

India is the fourth-largest producer of agrochemicals in the world. The Indian agrochemicals industry was valued at around INR 42,000 crore in FY20,out of which domestic consumption was worth around INR 20,000 crore, while exports during the same period were worth around INR 22,000 crore [8,9]. The industry is expected to grow at a CAGR of 8–10% till 2025 and will be driven by several growth levers like increasing population, decreasing arable land, increasing demand for high-value agricultural products and increasing efforts from the industry and the Government to promote awareness and technology penetration [10].

GALILEO SENSA (Picoxystrobin 6.78% + Tricyclazole 20.33% w/w SC) systemic fungicide for control of leaf and neck blast of Paddy and anthracnose, wet rot and powdery mildew of Chilli and DELEGATE (SPINETORAM 11.7% SC) is spinosin class insecticide with broad spectrum control of insect pests in a variety of crops [11,12].

Positioning maps: "Marketers frequently create perceptual positioning maps as part of the planning process for their differentiation and positioning strategies to compare how consumers perceive their brands and competitor items on crucial buying criteria. The positioning of a brand must cater to the demands and tastes of well-defined target consumers". The views and expectations of customers are crucial to a business's success. Building a brand in the customers' minds is crucial in the competitive world of today. Businesses make an effort to understand how consumers relate various features to their products. The globalization and liberalization of markets throughout the world have led to a paradigm shift in the customers' point of view regarding the perceived values of a product, despite the fact that businesses differ in their advertising and promotional operations. Brand perceptions, consumer preferences, and company priorities have all changed as a result of the situation. The approach is not novel, but it is difficult for those without specialized

understanding to utilize and understand. Small businesses therefore rarely place their trademarks using perceptual mapping techniques. In order to develop a successful positioning strategy, consumer perception of brands must be investigated and visualized using graphical perceptual maps [13].

1.2 Status of Agrochemicals

1.2.1 Global scenario

The size of the worldwide agrochemicals market is predicted to increase from USD 221.38 billion in 2020 to USD 286.08 billion by 2030, at a CAGR of 2.89 percent over the forecast period. The use of bio-based agrochemicals, such as bio-fungicides and bio-fertilizers, to preserve crops and the environment has increased, despite the fact that synthetic fertilizers and pesticides have been a major contributor to meeting the world's expanding food demand [2].

India is a major importer and exporter of agrochemicals in terms of commerce. India shipped pesticides worth USD 3.4 billion (9.4% of worldwide exports), making it the fifth-largest exporter of agrochemicals in 2019 [14].

1.2.2 Indian scenario

The Federation of Indian Chambers of Commerce & Sector, estimates that, India's agrochemical industry is predicted to increase 8–10 per cent by 2025. Due to the low level of agrochemical consumption, the industry has significant untapped potential. India consumes 0.6 kg/hectar pesticides, compared to 13.1 kg/hectare in China. 15 percent of the global market for agrochemicals comes from India. The raw material providers who provide both petrochemical derivatives and natural feedstock make up the worldwide agrochemical value chain. After the US, Japan, and China, India is currently the fourth-largest producer of agrochemicals. Insecticides, fungicides, herbicides, bio-pesticides, and others make up its main divisions. India's market was worth Rs 40,000 crore in FY20, with Rs 20,000 crore going toward domestic consumption. The domestic agricultural industry and exports have a significant impact on the sector. According to a Crisis analysis from December 2020, "India's strength lies in being a low-cost manufacturer, with its established presence in generic and trained labour standing it in good stead." A huge number of organized businesses are engaged in vigorous competition on the extremely fragmented Indian agrochemical sector. Some of the top businesses by market share include Bayer Crop Science, BASF, and Rallis India [15].

As of 2018, the Indian agrochemicals industry had a production capacity of 325.1 thousand MT [16].

The conventional network of retailers and distributors plays a significant role in the agrochemicals sector. There are 234,816 sales or distribution sites in FY20, out of which 147,360 were pesticides dealers or retailers and 66,491 were distributors. The remaining 21,000 sales or distribution outlets were made up of cooperatives, state departments of agriculture, and other organizations [10].

2. OBJECTIVES

- To identify the factors for the purchase of GALILEO SENSA and DELEGATE
- To study farmers' perception about GALILEO SENSA and DELEGATE
- To identify important promotional tools for the purchasing of GALILEO SENSA and DELEGATE
- To identify farmers' problems during purchasing of GALILEO SENSA and DELEGATE

3. MATERIALS AND METHODS

3.1 Data Collection

The research was based on primary and secondary data. Primary sources such as interviewing respondents and other secondary data based on online sources, research articles and magazines.

3.2 Research Design

- **Type of Research:** Descriptive research
- **Sample Unit:** Farmers
- **Sampling Method:** Non probability method
- **Sampling Technique:** Convenient Sampling
- **Sample Area:** Umreth taluka of Anand district
- **Sample Size:** 150
- **Analytical Tools:** Tabular analysis, Garrett's Ranking Technique, Graphical presentation, and Weighted Arithmatic Mean

Hypothesis 1

H_0– There is no significant relation between age and promotional tools for Galileo Sensa fungicide

Ha - There is significant relation between age and promotional tools for Galileo Sensa fungicide.

Hypothesis 2

H_0 – There is no significant relation between education and promotional tools for Galileo Sensa fungicide

Ha - There is significant relation between education and promotional tools for Galileo Sensa fungicide

Hypothesis 3

H_0 – There is no significant relation between income and promotional tools for Galileo Sensa fungicide

Ha - There is significant relation between income and promotional tools for Galileo Sensa fungicide

Hypothesis 4

H_0 – There is no significant relation between age and promotional tools for Delegateinsecticide

Ha - There is significant relation between age and promotional tools for Delegate insecticide

Hypothesis 5

H_0 – There is no significant relation between education and promotional tools for Delegate insecticide

Ha - There is significant relation between education and promotional tools for Delegate insecticide

Hypothesis 6

H_0 – There is no significant relation between income and promotional tools for Delegate insecticide

Ha - There is significant relation between income and promotional tools for Delegate insecticide.

Hypothesis 7

H_0 – There is no significant relation between age and education

Ha - There is significant relation between age and education

4. RESULTS AND DISCUSSIONS

4.1 Age of Respondents

Table 1 shows thatthe majority (59.33%) respondents were from 41-60 years age group, 35(23.33%) were from 21-40 years and 26(17.33%) respondents were from 61-80 years category. This implies that majority of the respondent from study area were from middle age group.

4.2 Education Qualification of the Respondents

From Table 2, it was found that the largest group of individuals (29.33%) had education up to the primary level, followed by those who had completed up to SSC (27.33%). The smallest group of individuals (10.67%) had completed graduation or above.

4.3 Total Land Holdings of Respondents

A perusal of Table 3, revealed that the majority of farmers (54%) fall under the "Small" category, owning land between 1.1-2 hectares. The second most common category was "Marginal" farmers owning less than 1 hectare of land (20%). The smallest group of farmers were those who categorized as "Large", owning more than 10 hectares of land (4.67%).

4.4 Farming Experience of Respondents

Table 4 presents that 37.33 percent of the farmers had 11 to 20 years of experience,followed by 21 to 30 years of experience (26.67%), and 0 to 10 years of experience (26.67%), 14percent of the farmers had 31 years and above of experience.

4.5 Occupation of the Respondent

In the survey, it was revealed that 69.33 percent of the farmers depends on agriculture + animal husbandry as their occupation for their livelihood followed by 21.33 percent of the farmers depends on agriculture as their sole occupation. 9.33 percent of farmers depended on Agriculture combined with allied activity as their occupation in the study area (Table 5).

4.6 Income of Respondents

From Table 6, it was observed that 18.89 per cent of the respondents had a family income of less than 1 lakh, 57.78per cent of respondents had 1-5 lakhs, 16.11per cent of respondents had

5-10 lakhs and only 7.22 per cent of the respondents had family income more than 10 lakhs. It was observed that respondents with more income have agriculture along with allied sectors.

4.7 Factors for the Purchase of Galileo Sensa and Delegate

4.7.1 Factors for the purchase of Galileo sensa

Table 7 exhibits the factorsinfluencing [17] purchase of Galileo sensa fungicides, It appears that quality was the most important factor (1st rank), followed by best result (2nd rank) and crop growth (3rd rank). Packaging size and availability were ranked fourth and fifth, respectively, while low price was ranked sixth and least important.

4.7.2 Factors for the purchase of delegate

Table 8 shows the factors influencing purchase of Delegate insecticides, it appears that quality was the most important factor (1st rank), followed by best result (2nd rank) and crop growth (3rd rank). Packaging size and availability were ranked fourth and fifth, respectively, while low price was ranked sixth and least important.

4.8 Farmers' Perception about Galileo Sensa and Delegate

Fig. 1 mentioned the perceptual map according to the respondents' perception about Galileo Sensa and Delegate in the study area on the basis of two parameters, Safe for Farmer& Land and Safe for Chilli crop. From Fig. 1, it was observed that according to the respondents' perception about both the products that they were close competitor to each other. The figure also revealed that both the products were safe for farmers & land and safe for chilli crop.

Fig. 2 mentioned the perceptual map according to the respondents' perception about Galileo Sensa and Delegate in the study area on the basis of two parameters Price and Quality. From Fig. 2, it wasobserved that according to the respondents' perception of given parameter price and quality, each product comes under high price and good quality.

4.9 Important Promotional Tools for the Purchasing of Galileo Sensa and Delegate [18,19]

4.9.1 Important promotional tools for the purchasing of Galileo sensa

Table 9 show that the most used promotional tools for purchasing of Galileo Sensawere farmer meetings (90%), followed by retailers' suggestions (65.33%), leaflets (77.33%), and posters (72%). Farmers'/friends' suggestions and retailers' suggestions were also relatively effective, with 85 and 98 frequencies of use and 56.67 and 65.33 percentages of effectiveness.

4.9.2 Important Promotional Tools for the Purchasing of Delegate

Table 10 presents that the most used promotional tools for Delegatewere farmer meetings (90%), followed by Wallpainting (81.33%), Leaflets (77.33%), Posters (72%), Jeep campaigns (68%), Exhibitions (49.33). Farmers'/friends' suggestions and retailers' suggestions were also relatively effective, with 85 and 98 frequencies of use and 56.67 and 65.33 percentages of effectiveness.

Table 1. Age of respondents in the study area

Sr. No.	Age (Year)	Frequency (n)	Percentage (%)
1	21-40 years	35	23.33
2	41-60 years	89	59.33
3	61-80 years	26	17.33
	Total	**150**	**100**

Table 2. Education qualifications of the respondents

Sr. No.	Qualification	Frequency (n)	Percentage (%)
1	Illiterate	23	15.33
2	Up to Primary	44	29.33
3	< = SSC	41	27.33
4	<= HSC	26	17.33
5.	Graduation & above	16	10.67
	Total	**150**	**100**

Table 3. Total land holdings of respondents

Sr. No.	Area (Ha)	Classification of Farmers	Frequency (n)	Percentage (%)
1	Below 1 ha	Marginal	30	20
2	1.1-2 ha	Small	81	54
3	2.1-4 ha	Semi-Medium	20	13.33
4	4.1-10 ha	Medium	12	08
5	above 10 ha	Large	7	04.67
	Total		**150**	**100**

Table 4. Farming experience of respondents

Sr No	Farming experience(years)	Frequency(n)	Percentage (%)
1	0 to 10	33	22
2	11 to 20	56	37.33
3	21 to 30	40	26.67
4	31 and above	21	14
	Total	**150**	**100**

Table 5. Occupation of the respondent

Sr No	Particulars	Frequency(n)	Percentage (%)
1	Agriculture	32	21.33
2	Agriculture + animal husbandry	104	69.33
3	Agriculture + allied activity	14	09.33
	Total	**150**	**100**

Table 6. Income of respondents

Sr. No	Income	Frequency(n)	Percentage (%)
1	< 1 lakh	26	17.33
2	1.1-5 lakhs	86	57.33
3	5.1-10 lakhs	25	16.67
4	>10 lakhs	13	08.67
	Total	**150**	

Table 7. Factors for the purchase of Galileo sensa

Factors No	Factor	Mean Score	Rank
F1	Quality	69.55	1
F2	Best result	62.17	2
F3	Crop growth	50.00	3
F4	Packaging size	48.03	4
F5	Availability	42.48	5
F6	Low price	26.73	6

Table 8. Factors for the purchase of delegate

Factors No	Factor	Mean Score	Rank
F1	Quality	69.55	1
F2	Best result	62.17	2
F3	Crop growth	50.00	3
F4	Packaging size	48.03	4
F5	Availability	42.48	5
F6	Low price	26.73	6

4.10 Farmers' Problems During Purchasing of Galileo Sensa and Delegate [20,21]

4.10.1 Farmers' problems during purchasing of Galileo sensa

Table 11 exhibits that the Preferred brand not available was the biggest problem among the listed issues, with a mean score of 4.1 which ranked first. The second biggest problem was Lack of credit availability with a mean score of 3.8 and ranked second. Relative high price was ranked third with a mean score of 3.62. No discount was ranked fourth with a mean score of 3.5, followed by After sales service in fifth place with a mean score of 3. Late supply was ranked sixth with a mean score of 2.58, and Packaging size was ranked last with a mean score of 2.3. These rankings suggest that farmers were primarily concerned about product availability and accessibility, pricing, and discounts, followed by the quality of after-sales service and the reliability of supply.

4.10.2 Farmers' problems during purchasing of delegate

Table 12 show that the Preferred brand not being available was the biggest problem for farmers while purchasing Delegate, with a mean score of 4.27 and ranked first. The second biggest problem was Lack of credit availability with a mean score of 4.2 and ranked second. Relative high price was ranked third with a mean score of 3.33. No discount was ranked fourth with a mean score of 3.2, followed by After sales service in fifth place with a mean score of 2.87. Late supply was ranked sixth with a mean score of 2.8, and Packaging size was ranked last with a mean score of 2.3. These rankings suggest that farmers were primarily concerned about product availability and accessibility, pricing, and discounts, followed by the quality of after-sales service and the reliability of supply.

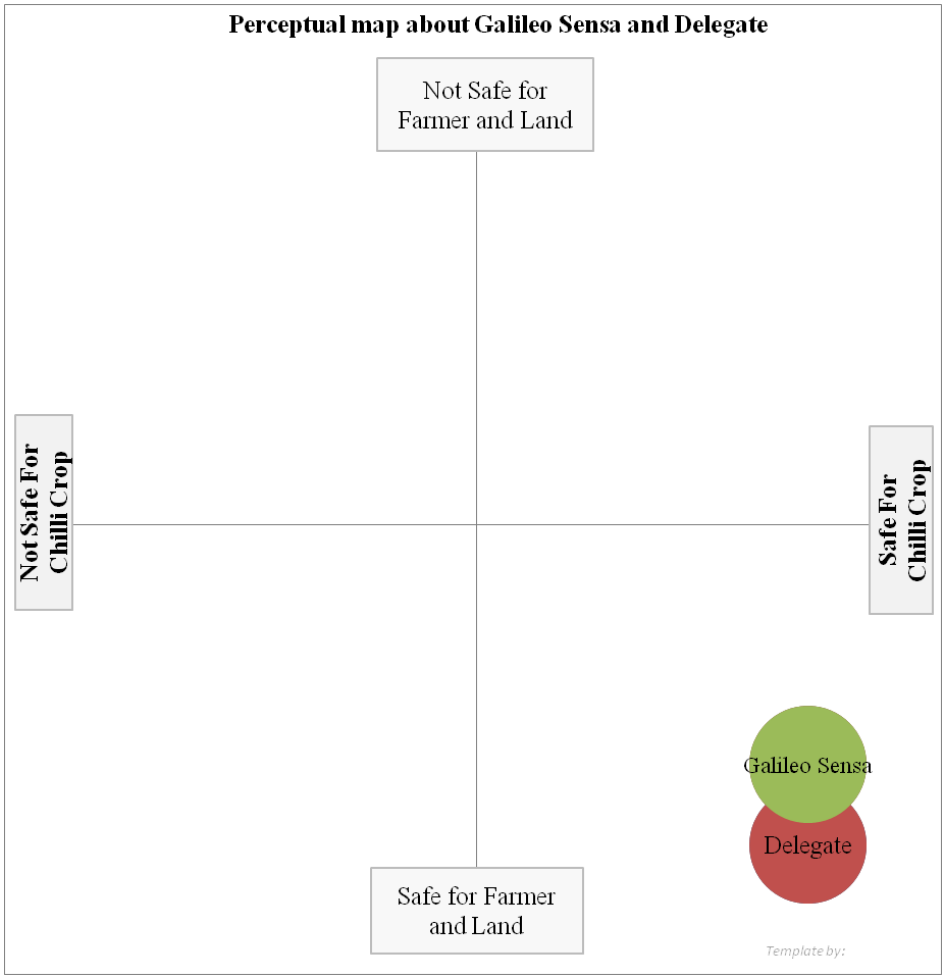

Fig. 1. Perceptual map on the basis of safe for farmer & land and safe for chilli crop

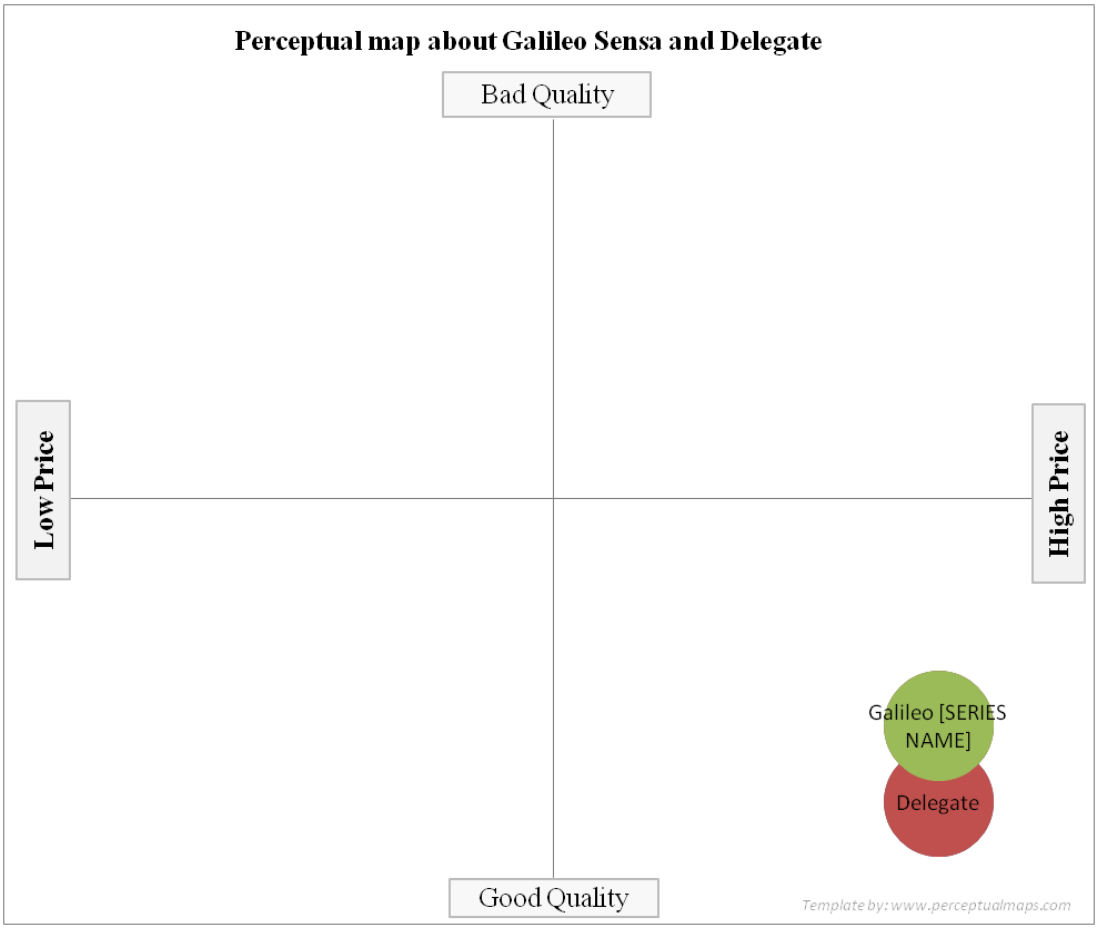

Fig. 2. Perceptual map on the basis of price and quality

Table 9. Important promotional tools for Galileo sensa

Sr. No.	Promotional Tools	Frequency(n)	Percentage (%)
1	Leaflets	116	77.33
2	Posters	108	72
3	Farmer meeting	135	90
4	Farmers/friends' suggestion	85	56.67
5	Retailers'suggestion	98	65.33

Table 10. Important promotional tools for delegate

Sr. No.	Promotional Tools	Frequency(n)	Percentage (%)
1	Leaflets	116	77.33
2	Posters	108	72
3	Farmer meeting	135	90
4	Jeep campaigns	102	68
5	Wallpainting	122	81.33
6	Exhibitions	74	49.33
7	Farmers/friends' suggestion	85	56.67
8	Retailers'suggestion	98	65.33

Table 11. Problems during purchasing of Galileo sensa

Problems	WAM	Rank
Preferred brand is not available	4.1	1
Lack of credit availability	3.8	2
Relative high price	3.62	3
No discount	3.5	4
After sales service	3	5
Late supply	2.58	6
Packaging size	2.3	7

Table 12. Problems during purchasing of delegate

Problems	WAM	Rank
Preferred brand is not available	4.27	1
Lack of credit availability	4.2	2
Relative high price	3.33	3
No discount	3.2	4
After sales service	2.87	5
Late supply	2.8	6
Packaging size	2.3	7

4.11 Pearson Chi-square Test

Hypothesis 1:

Table 13 presents the chi-square test results of hypothesis. Here, for age and leaflet as promotional tool, the p value is 0.000 which is less than 0.05 and calculated chi-square value is 26.335 which is higher than table value (5.991), indicatingthat there is significant relation between age and use of leaflet as promotional tool. Same as for other all promotional tool, p value is 0.000 which is less than 0.05 and calculated chi-square value is greater than table chi-square valueso researcher reject the null hypothesis indicating that thereis significant and positive relation between age and allpromotional tools for Galileo sense fungicide. So, it was concluded that age has positive impact on promotional tools as age increases use of promotional tool as source of awareness.

Hypothesis 2:

Table 14 presents the chi-square test results of hypothesis. Here, for education and leaflet as promotional tool, the p value is 0.001 which is less than 0.05 and calculated chi-square value is 19.865 which is higher than table value (9.488), indicating that there is significant relation between education and use of leaflet as promotional tool. Same as for other all promotional tool, p value is between 0.000 to 0.006 which is less than 0.05 and calculated chi-square value is greater than table chi-square value so researcher reject the null hypothesis indicating that there is significant and positive relation between education and all promotional tools for Galileo sense fungicide. So, it was concluded that education has positive impact on promotional tools as education increases use of promotional tool as source of awareness.

Hypothesis 3:

Table 15 presents the chi-square test results of hypothesis. Here, for income and leaflet as promotional tool, the p value is 0.000 which is less than 0.05 and calculated chi-square value is 130.832 which is higher than table value (7.815), indicating that there is significant relation between income and use of leaflet as promotional tool. Same as for other all promotional tool, p value is 0.000 which is less than 0.05 and calculated chi-square value is greater than table chi-square value so researcher reject the null hypothesis indicating that there is significant and positive relation between income and all promotional tools for Galileo sense fungicide. So, it was concluded that income has positive impact on promotional tools as income increases use of promotional tool as source of awareness.

Hypothesis 4:

Table 16 presents the chi-square test results of hypothesis. Here, for age and leaflet as promotional tool, the p value is 0.000 which is less than 0.05 and calculated chi-square value is

26.335 which is higher than table value (5.991), indicating that there is significant relation between age and use of leaflet as promotional tool. Same as for other all promotional tool, p value is 0.000 which is less than 0.05 and calculated chi-square value is greater than table chi-square value so researcher reject the null hypothesis indicating that there is significant and positive relation between age and all promotional tools for Delegate insecticides. So, it was concluded that age has positive impact on promotional tools as age increases use of promotional tool as source of awareness.

Hypothesis 5:

Table 17 presents the chi-square test results of hypothesis. Here, for education and leaflet as promotional tool, the p value is 0.001 which is less than 0.05 and calculated chi-square value is 19.865 which is higher than table value (9.488), indicating that there is significant relation between education and use of leaflet as promotional tool. Same as for other all promotional tool, p value is between 0.000 to 0.006 which is less than 0.05 and calculated chi-square value is greater than table chi-square value so researcher reject the null hypothesis indicating that there is significant and positive relation between education and all promotional tools for Delegate insecticides. So, it was concluded that education has positive impact on promotional tools as education increases use of promotional tool as source of awareness.

Hypothesis 6:

Table 18 presents the chi-square test results of hypothesis. Here, for income and leaflet as promotional tool, the p value is 0.000 which is less than 0.05 and calculated chi-square value is 130.832 which is higher than table value (7.815), indicating that there is significant relation between income and use of leaflet as promotional tool. Same as for other all promotional tool, p value is 0.000 which is less than 0.05 and calculated chi-square value is greater than table chi-square value so researcher reject the null hypothesis indicating that there is significant and positive relation between income and all promotional tools for Delegate insecticides. So, it was concluded that income has positive impact on promotional tools as income increases use of promotional tool as source of awareness.

Hypothesis 7:

Table 19 shows the chi-square test results of hypothesis. The table shows that p value is 0.007 which is smaller than 0.05 and calculated chi-square value is 21.087 which is greater than the table value 15.507, implies that null-hypothesis is rejected. This indicates that there is positive and significant relation between age and education. The value is positive implies that as age increase education also increase.

Table 13. Age and promotional tools for Galileo sensa fungicide

Variables	Pearson Chi-Square	df	Asymptotic Significance
Age-Leaflets	26.335	2	.000
Age-Posters	26.853	2	.000
Age-Farmer meeting	15.496	2	.000
Age-Farmers/friends suggestion	22.711	2	.000
Age-Retailers' suggestion	22.095	2	.000

Table 14. Education and promotional tools for Galileo sensa fungicide

Variables	Pearson Chi-Square	df	Asymptotic Significance
Education-Leaflets	19.865	4	.001
Education -Posters	25.054	4	.000
Education -Farmer meeting	14.882	4	.005
Education -Farmers/friends suggestion	14.617	4	.006
Education -Retailers' suggestion	17.505	4	.002

Table 15. Income and promotional tools for Galileo sensa fungicide

Variables	Pearson Chi-Square	df	Asymptotic Significance
Income-Leaflets	130.832	3	.000
Income -Posters	131.082	3	.000
Income-Farmer meeting	129.556	3	.000
Income -Farmers/friends suggestion	74.566	3	.000
Income -Retailers' suggestion	98.249	3	.000

Table 16. Age and promotional tools for delegate insecticides

Variables	Pearson Chi-Square	df	Asymptotic Significance
Age-Leaflets	26.335	2	.000
Age-Posters	26.853	2	.000
Age-Farmer meeting	15.496	2	.000
Age-Jeep campaign	25.504	2	.000
Age-Wall painting	33.419	2	.000
Age-Exhibition	20.418	2	.000
Age-Farmers/friends suggestion	22.711	2	.000
Age-Retailers' suggestion	22.095	2	.000

Table 17. Education and promotional tools for delegate insecticides

Variables	Pearson Chi-Square	df	Asymptotic Significance
Education-Leaflets	19.865	4	.001
Education-Posters	25.054	4	.000
Education-Farmer meeting	14.882	4	.005
Education- Jeep campaign	19.613	4	.001
Education-Wall painting	21.723	4	.000
Education-Exhibition	10.369	4	.035
Education-Farmers/friends suggestion	14.617	4	.006
Education-Retailers' suggestion	17.505	4	.002

Table 18. Income and promotional tools for delegate insecticides

Variables	Pearson Chi-Square	df	Asymptotic Significance
Income-Leaflets	130.832	3	.000
Income-Posters	131.082	3	.000
Income-Farmer meeting	129.556	3	.000
Income - Jeep campaign	109.388	3	.000
Income -Wall painting	110.480	3	.000
Income -Exhibition	65.148a	3	.000
Income -Farmers/friends suggestion	74.566	3	.000
Income -Retailers' suggestion	98.249	3	.000

Table 19. Association between age-education

Variables	Pearson Chi-Square	df	Asymptotic Significance
Age-Education	21.087	8	.007

5. CONCLUSIONS

The study revealed that the majority of farmers fell within the age range of 41-60 years and had education level up to primary standard.Additionally, most of the farmers owned land holdings between 1.1-2 hectares (small farmers) and engaged in agriculture combined

with animal husbandry. The top factors influencing the purchase of both products were identified as quality, best result, and crop growth, while low price ranked the lowest.Farmers' perception about Galileo Sensa as a product was it offered a price matching to its quality and safe for chilli, farmers, and soil. Farmers' perception about Delegate as it was safe for chilli, with a price matching to its quality and safe for farmers and soil. Farmer meetings emerged as the most important promotional tool for both products. However, the main problems faced by farmers during the purchasing of both products included the unavailability of preferred brands, lack of credit availability, and relative high prices.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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