



## Awareness and Purchasing Behaviour of Farmers towards Insecticides for Sesamum Crop in Jamnagar District of Gujarat

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**ABSTRACT:** This study examines farmers' awareness and purchasing behaviour regarding insecticides for sesamum crop growers in Jamnagar district in the vibrant state of Gujarat. A survey was conducted over three months with 200 farmers from four Talukas of Jamnagar district with the research objectives of analyzing socio-economic characteristics, brand awareness, purchasing behaviour and suggesting effective promotional tools for insecticides. Findings revealed that the farmer demographic was predominantly male, aged 31-50, with higher secondary or secondary education. Most were small and marginal farmers with extensive farming experience, owning less than 2 hectares of land and annual family incomes between Rs 1,00,000 and Rs 3,00,000. All farmers were aware of insect-caused diseases and used insecticides based on dealer recommendations, with high awareness of brands, products, and product quality. UPL insecticides were most preferred due to superior performance and quality, followed by brands like Dhanuka, Gharda, Bayer, and Sumitomo. Key purchasing factors included competitive pricing, past experience, and progressive farmers' opinions. Most insecticides were purchased from local dealers. Based on the analyzed data, it was suggested that companies should enhance dealer-oriented promotional schemes, provide better credit terms, and emphasize field demonstrations and farmer meetings to increase product familiarity and influence farmers' purchasing decisions. It was also emphasized that pesticide manufacturers ought to simplify their marketing materials and incorporate regional languages for promoting product awareness among the less educated farmers.

**Keywords:** Awareness, Field Demonstrations, Insecticides, Progressive Farmers, Purchasing Behaviour, Sesamum.

### INTRODUCTION

The agrochemical industry encompasses a wide range of chemical products used in agriculture, including pesticides such as fungicides, insecticides, herbicides, and nematicides, as well as synthetic fertilizers, hormones, and other growth stimulants. According to the Food and Agriculture Organization (FAO) of the United Nations, pesticides are substances intended for the prevention, destruction, or control of pests that damage agricultural products and commodities. India is a major player in the global agriculture sector, with agriculture being the principal source of income for over 55% of its population. The country is the world's largest producer of milk, pulses, and spices, and it holds significant positions in the production of other crops and livestock. In India, agrochemicals play a vital role in crop protection and productivity, as pests and diseases cause substantial losses to agricultural output. The agrochemical industry in India is highly structured, with about 125 manufacturers of technical grade agrochemicals and over 1,45,000 distributors.

Agrochemicals are crucial for protecting crops, soil, irrigation water, and seeds from pests, weeds, and diseases. The global agrochemicals market was valued at USD 271.42 billion in 2023, with significant growth projected due to the increasing demand for fertilizers and crop protection products. The Indian agrochemicals market was estimated at USD 33.16 billion in 2023 and is also expected to grow substantially. Fertilizers hold the largest market share, and crop protection chemicals are anticipated to grow rapidly due to increasing pest and disease pressures.

The Indian agrochemical sector is highly competitive, with numerous formulators and significant market players such as United Phosphorus Ltd., BASF India Ltd., and Rallis India Ltd. Market trends include a focus on developing environmentally friendly pesticides, brand building by major companies, and strategic partnerships. Technological advancements and government initiatives, such as the "Make in India" campaign, support the industry's growth. Key challenges include high R&D costs, threats from genetically modified seeds, and the need for efficient

distribution systems. However, there are significant opportunities for increased usage, technology adoption, customized crop solutions, and expanding export markets. The industry's future growth will be driven by rising agricultural demand, technological advancements, government support, and sustainable 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.

Bambhaniya (2019) studied buying behaviour of frozen foods in Gujarat state. The sample size was of the two-hundred consumers. Multiple regression method was used. The result revealed that (27%) per cent consumers got information through posters. (37%) consumers used to buy the product as and when and (61%) consumers purchase the product without planning. The (37%) of consumers were influenced by discount offer followed by (44%) consumers themselves decided to buy the product and (54%) of the consumers have purchased the product from the mall.

Faridi *et al.* (2021) conducted a study entitled "Socio-Economic Status of Farming Community: A Case of District Rajanpur" in the broad area of agribusiness and rural sector development. A total 250 farmer respondents were interviewed for the study purpose. Household per capita income was used to understand the condition of the farmers. It was observed that by increasing per capita income, factors including education, health, land ownership, hybrid seeds, and mechanization have a substantial impact on farmers' ability to support themselves.

Chouhan (2022) studied "Awareness about the use of agrochemicals by the farmers in rural areas of Solan (H.P.), India". The study found that 72.88% of small landowners used pesticides and fertilizers to increase income, with 33.89% investing 5-10% of their funds in these products. Most farmers (94.9%) used pesticides for crop protection, and 63.56% took measures to improve soil fertility. However, 73.73% used pesticides more than four times per season, and 42.53% did not take necessary precautions. These findings underscore the need for policies to ensure safe and effective agrochemical use, aiming to improve yields and reduce health and environmental risks.

Kumar *et al.* (2023) conducted a study on "Marketing of Insecticides (Ampligo) in Bijnor District of Uttar Pradesh". For research purpose, multistage sampling method was used. Total sample size was 120 farmers and 35 dealers. Almost all agrochemical companies generated demand from farmers by introducing various schemes, price discount and field demonstration to the farmers. Based on above analysis on market functioning and consumer's buying Behaviour, the company should appoint sales manager and regular promotional activities for improvement of sales of Syngenta Pvt. Ltd. in the studied area.

Dabhi and Thakkar (2024) conducted a study on "Awareness, Buying Behaviour and Constraints of Farmers for Fungicides in Botad District of Gujarat" and reported that the most influencing factors for purchase of fungicides was dealer recommendation followed by past experience and price. This study also suggested progressive measures to be adopted by the companies like emphasizing dealer relationships, using past positive experiences, and competitive pricing. Likewise many earlier studies, this study also strongly recommended the companies to focus on having dealer oriented sales promotion schemes.

## METHODOLOGY

The research was conducted the study, which focuses on Jamnagar District in Gujarat due to its prominent sesamum production. The study employed a descriptive research design to understand various attributes affecting farmers' behaviour. It involved both primary and secondary data collection methods. Primary data were gathered through structured interviews with 200 farmers from four selected talukas, while secondary data were sourced from company records and relevant literature.

The multi-stage sampling technique was used, focusing on areas with high sesamum production. Four talukas Dhrol, Jamnagar, Kalavad, and Jodiya were selected, and within these, five villages were chosen randomly. In each village, ten farmers were sampled, resulting in a total of 200 participants.

Data collection took place between March and May 2024. The analysis used tabular methods and statistical tools such as mean scores, percentages, and Likert scales. The study also applied chi-square tests to examine associations between different variables, including land holding and packaging preferences, as well as annual income and payment methods.

Overall, the research aimed to describe the current state of farmers' purchasing behaviours and perceptions regarding insecticides, using a combination of qualitative and quantitative methods to ensure comprehensive analysis.

## RESULTS AND DISCUSSION

**To study the socio-economic profile of sesamum farmers.** Out of 200 respondents, majority of farmers are male 96 percent, with only 4 percent being female. Age-wise, the largest group 37 percent of farmers falls within the 41-50 years range. Educational attainment shows that 31 percent of the farmers have completed their Higher Secondary Certificate (HSC). Family structure is almost evenly split, with 51.5 percent living in joint families. In terms of farming experience, 31.5 percent of the farmers have 5-10 years of experience, indicating a relatively experienced workforce. Agriculture remains the primary occupation for 51 percent of the farmers. Landholding patterns reveal that 30.5 percent are marginal farmers with up to 1 hectare of land. Irrigation methods show a strong preference for surface irrigation, used by 68.5 percent of the farmers. Lastly, income distribution indicates that 25.5 percent of the farmers have an annual income between

₹100,001 and ₹200,000. These insights provide a comprehensive overview of the key demographic and socioeconomic characteristics of the farming community in Jamnagar district.

**Table 1: To study the socio-economic profile of sesamum farmers.**

Variables	Parameters	Frequency	Percentage
<b>Gender</b>	Male	192	96.00
	Female	8	4.00
<b>Age group of farmers</b>	21 – 30 years	28	14.00
	31 – 40 years	63	31.50
	41 – 50 years	74	37.00
	Above 50 years	35	17.50
<b>Education level of the farmers</b>	Below SSC	41	20.50
	SSC	58	29.00
	HSC	62	31.00
	Graduate	33	16.50
	Post - Graduate	6	3.00
<b>Land holding size of the farmers</b>	Marginal	61	30.50
	Small	52	26.00
	Medium	49	24.50
	Large	38	19.00
<b>Farming Experience of the farmers</b>	Below 5 years	37	18.50
	>5 – 10 years	63	31.50
	>10 – 15 years	59	29.50
	Above 15 years	41	20.50
<b>Method of Irrigation</b>	Surface	137	68.50
	Drip	42	21.00
	Sprinkler	21	10.50
<b>Annual income of the farmers</b>	Below 1,00,000 ₹	48	24.00
	1,00,001 to 2,00,000 ₹	51	25.50
	2,00,001 to 3,00,000 ₹	45	22.50
	3,00,001 to 4,00,000 ₹	34	17.00
	Above 4,00,000 ₹	22	11.00

**To study the Sesamum farmers' awareness of insecticides.** All farmers surveyed (100%) were aware of various insects affecting their crops. The primary sources of information about insecticides were farmer meetings, relied upon by 167 farmers, followed by dealers or agro service centers (156 farmers), advertisements (138 farmers), progressive farmers (132 farmers), and company representatives (125 farmers). Regarding insecticide brands for sesamum crop cultivation, UPL was the leading choice, used by 85 farmers. Other local brands were preferred by 78 farmers, and Dhanuka by 71. Brands such as BASF, Adama, Syngenta, Sumitomo, Corteva, and TATA Rallis were also commonly utilized.

Insecticide brand preference showed a diverse pattern, with UPL leading at 18.5% usage, followed by "Other" brands at 14%, and Dhanuka at 11.5%. Gharda (9.5%) and Bayer (8%) also held notable shares, while Adama, TATA Rallis, and BASF had around 6-7% usage each. Factors influencing brand switching included advice from dealers/agro service centers (159 farmers), progressive farmers (117), and company personnel (112). Additionally, advertisements influenced 106 farmers, while 82 made independent decisions, highlighting the varied factors shaping farmers' insecticide choices.

**To study the sesamum farmers' purchasing behaviour towards insecticide.** Most of the farmers (50.5%) purchased insecticides from local dealers or retailers, making this the most common source. Another 31.5% of farmers bought insecticides from both local

dealers and online platforms, reflecting a blended approach to purchasing. A smaller portion, 18%, relied solely on online platforms for their purchases. When it came to influencing these buying decisions, 135 farmers were guided by information obtained from farmer meetings, which was the leading source of influence. Following this, 118 farmers made their purchases based on advice from agro service centers, and 113 were influenced by field demonstrations. Advertisements also played a role, affecting 109 farmers, while 82 farmers made their purchases based on recommendations from progressive farmers.

Farmers used various payment methods when buying insecticides. The largest group, 36.5%, used credit for payments across both in-person and online purchases. Another 31% of farmers utilized a mix of cash and credit for their payments. Online payment methods were adopted by 19% of farmers, while 13.5% of them opted for cash-only payments. Experience levels also played a role in farmers' purchasing behaviors, with those having 6 to 9 years of experience making up the largest group at 36%. Farmers with 3 to 6 years of experience followed closely behind, accounting for 31.5%. Those with more than 9 years of experience made up 19%, and farmers with less than 3 years of experience represented 13.5%. Regarding purchasing frequency, 41% of farmers bought insecticides four times a year, followed by 27% who bought three times, and 17% who purchased twice a year. Only 9% of farmers made more than four purchases annually, and 6% bought insecticides just once a year. Packaging size

preferences also varied, with 34.5% of farmers preferring 500 ml sizes, followed by 26.5% choosing 1000 ml, 20.5% favoring 250 ml, and 18.5% opting for 100 ml packages. This indicates that mid-sized packaging options (500 ml and 1000 ml) are the most popular choices among farmers.

As mentioned in Table 2 regarding Factor considered while purchasing insecticide, it is clear that most affecting factor was Price (mean-3.67), followed by past experience (mean-3.62), progressive farmers opinion (mean-3.55), Dealer Support (mean-3.52),

Credit facility (mean-3.51), Availability (mean-3.47), Brand image (mean-3.42), Farm size (mean-3.28) and least affecting factor was Social media (mean-3.26).

From the Table 3, it could be inferred that the value of chi square statistics is 20.95 which is greater than the chi square table value at 0.05 level with degree of freedom is 9. Hence it could be interpreted that chi square statistics is significant. So, relation between land holding and Most Preferred Packaging Size of insecticides is established.

**Table 2: Factor considered while purchasing insecticides (n= 200).**

Factors	Highly important	Important	Neutral	Somewhat important	Unimportant	Total	CS*	Mean**	Rank
Brand Name	54	51	43	28	24	200	683	3.42	VII
Dealer support	54	59	46	19	22	200	704	3.52	IV
Progressive farmer opinion	57	53	48	26	16	200	709	3.55	III
Social media	45	48	47	33	27	200	651	3.26	IX
Farm size	43	51	49	32	25	200	655	3.28	VIII
Price	62	56	48	21	13	200	733	3.67	I
Availability	54	51	48	28	19	200	693	3.47	VI
Credit facility	55	52	49	27	17	200	701	3.51	V
Past experience	61	56	46	19	18	200	723	3.62	II

Figures in the parenthesis represent cumulative score obtained by CS = Score Value of Response x No. of Farmers  
HA–Highly Important (5), I – Important (4), N – Neutral (3), SI – Somewhat Important (2), UI - Unimportant (1)

**Table 3: Association between land holding and Most Preferred Packaging Size of insecticides.**

Count of Total land holding (ha)	Column labels				
Row Labels	100ml	250ml	500ml	1000 ml	Grand Total
Less than 1 ha	19	13	18	11	61
1.1 to 2 ha	10	15	15	12	52
2.1 to 4 ha	5	8	17	19	49
More than 4 ha	3	5	19	11	38
Grand Total	37	41	69	53	200
<b>Chi square test</b>					
Chi square statistics value		df		Chi square table value (0.05)	
20.95		9		16.92	

**Table 4: Association between Annual Income and Mode of Payment Preferred for Purchasing of Insecticides.**

Count of Total land holding (ha)	Column labels					
Row Labels	Below 1,00,000	1,00,001 – 2,00,000	2,00,001 – 3,00,000	3,00,001 – 4,00,000	Above 4,00,000	Grand Total
Cash only	5	6	7	4	5	27
Credit only	24	21	10	9	9	73
Cash and credit both	10	15	17	15	5	62
Online	9	9	11	6	3	38
Grand Total	48	51	45	34	22	200
<b>Chi square test</b>						
Chi square statistics value			df		Chi square table value (0.05)	
14.13			12		21.03	

From the Table 4, it could be inferred that the value of chi square statistics is 14.13 which is lower than the chi square table value at 0.05 level with degree of freedom is 12. Hence it could be interpreted that chi square statistics is no significant. So, the relation between

annual income and mode of payment preferred for purchasing of insecticides is not established.

**TO STUDY EFFECTIVE PROMOTIONAL TOOLS FOR MARKETING OF INSECTICIDES**

From the Table 5 indicates the ranking of Effective Promotional tools for marketing of insecticides. Farmer meeting (47057) secured first rank among all the factor followed by Farm demonstration (46315) and Retailers'

suggestion (45549). It could be concluded that Effective Promotional tools for marketing of insecticides were Farmer meeting, Farm demonstration and Retailers' suggestion.

**Table 5: Effective Promotional tools for marketing of insecticides.**

Factors	Garret score	Mean score	Rank
Free sample	44463	222.32	V
Discount/Scheme	44593	222.97	IV
Retailers' suggestion	45549	227.75	III
Farm demonstration	46315	231.58	II
Posters	43422	217.11	VIII
Exhibition	42535	212.68	IX
Campaign	43551	217.76	VII
Print Ads	43686	218.43	VI
Online Ads	41629	208.15	X

## CONCLUSIONS

The present study, conducted in the Jamnagar district of Gujarat, aimed to assess sesamum farmers' awareness of insecticides. It also examined farmers' purchasing behaviour and the promotion tools of insecticides. Using a multi-stage sampling method, 200 farmers were selected for the study. The findings revealed that most farmers learn about insecticides from dealers and use them based on their recommendations. Farmers are familiar with various insecticide brands and predominantly prefer UPL's products, followed by other local brands, Dhanuka, Gharda, Bayer, etc. Their preference for specific insecticides is influenced by competitive pricing, past experiences, and the opinions of progressive farmers. Most farmers purchase insecticides from local dealers, often on credit. Price sensitivity is significant, leading farmers to switch brands when prices are high, products are unavailable, or credit facilities are lacking. To retain customers, companies should offer discounts and competitive pricing. Farmers' choices are also strongly influenced by farmer meetings and field demonstrations.

## RECOMMENDATIONS

1. Since 60% of farmers have an education SSC or HSC degree, pesticide manufacturers ought to simplify their marketing materials and incorporate regional languages. Less educated farmers will benefit from this by having a better understanding and confidence in using insecticides.
2. Maximum number of farmers purchased insecticides from Agro service center. So, company need to carry out more Dealer oriented sales promotional schemes, as they are most important source of information for farmers.
3. Credit was most important to farmers for purchase of insecticides. So, company should provide better credit

terms to dealers; so as to provide better credit facilities to farmers, as the price of the product is high.

4. Farmers prefer particular brand because of the result and long-lasting effect. So, company should focus on this parameter and need to promote result of their product by field demonstration and farmers' meeting.

5. As farmers are strongly influenced by farmer meeting and field demonstration while choosing the insecticides, so company need to build a marketing or promotional methods to increase farmers familiarity with its products in order to survive well in market and give tough competition to competitors.

## REFERENCES

- Bambhaniya, A. D. (2019). Study on buying behaviour on frozen foods in Gujarat state. M.B.A. (Agri Business) Thesis. Junagadh Agriculture University, Junagadh.
- Chouhan, S. (2022). Awareness about the use of agrochemicals by the farmers in rural areas of Solan (HP) India.
- Dabhi, Divya, G. & Thakkar, Mehul, G. (2024). Awareness, Buying Behaviour and Constraints of Farmers for Fungicides in Botad District. *Biological Forum – An International Journal*, 16(8), 290-295.
- Food and Agriculture Organization of the United Nations. FAO Home. Retrieved from <http://www.fao.org/>
- Faridi, M. Z., Ahmad, R., Bashir, F. & Khan, M. S. (2021). Socio-Economic Status of Farming Community: A Case of District Rajanpur. *Review of Applied Management and Social Sciences*, 4(2), 485-494.
- India Agrochemicals Market Report and Forecast (2024). Retrived from <https://www.expertmarketresearch.com/reports/india-agrochemicals-market>
- Kumar, S., Zechariah, J., Chauhan, U. & Saini, A. (2023). Study on Marketing of Insecticides (Ampligo) in Bijnor District of Uttar Pradesh. *International Journal for Research Trends and Innovation*, 8(6), 176-177.
- Zalavadiya, D., & Mishra, S. (2023). Awareness and Brand Preference of Chickpea Growers towards Selected Pesticides in Junagadh District of Gujarat, India. *Asian J. Agric. Ext. Econ. Soc*, 41(9), 486-494.

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