PURCHASING BEHAVIOUR AND PROBLEMS FACED BY FARMERS AND DEALERS RELATED TO INSECTICIDE

Abstract

Insecticides protect crops from insects by either killing them or preventing their attack. They assist in keeping the number of pests under the appropriate threshold level. A study entitled "Purchasing behaviour and problems faced by farmers and dealers related to insecticide" focused on understanding the factors that influence farmers' decisions while purchasing insecticides and identifies the problems they faced in the study area. The study aimed to provide insights into the socio-economic background of farmers, understand their purchasing behaviour towards insecticide, and assess the problems faced by farmers and dealers. The study was conducted in Keshod taluka in Junagadh district of Gujarat. Both primary and secondary data were used to meet the study's predetermined objectives. The semi-structured schedule was used to complete the primary survey. A total of 100 farmers and 30 dealers from the Keshod taluka made up the sample of 130 respondents. In this study, it was observed that the majority of farmers were between the age of 21 to 60 years. Most of the respondents had a joint family. A major part of the respondents were small and marginal farmers. The major issues faced by farmers were the high cost of pesticides and the lack of after-sales support. The major issues faced by farmers were the relatively high price and after-sale service.

Keywords: After-sales service, Dealers, Insecticide, Pesticide, Purchasing behaviour.

INTRODUCTION

Agriculture performs an essential hassle within the Indian economy. It is an important sector of the Indian economy and contributes 20.2 per cent of GDP and provides employment to around 50 to 60 per cent of the population. (Economic Survey 2021-2022) Crop protection chemicals play more than just a protective role; they also aid in increasing yield.

Pesticides are an important part of agriculture today due to their ability to protect crops reliably against pests and high yields [1]. The global agrochemicals market was valued at US$ 217.72 billion in 2021 and is expected to hit US$ 280.87 billion by 2030, poised to grow at a CAGR of 2.7% during the forecast period 2022 to 2030. In 2021, the fertilizers segment dominated the agrochemicals market with a revenue share of 67%. The cereals and grains segment accounted revenue share of 47% in 2021. While North America is the fastest growing market, Asia Pacific is the largest market of agrochemicals The industry is a highly competitive market with the presence of several multinational companies.

Indian agrochemicals industry was valued at around US$ 6 billion in the year 2022. The market is expected to grow at a CAGR of around 8.5% between 2023 and 2028 to reach a value of almost US$ 9.82 billion by 2028. The country has risen to become the world's 13th largest exporter of pesticides and is currently the fourth largest producer of agrochemicals in the world, behind the United States, Japan, and China. In terms of exports, the sector has seen good growth in the past years.

By either killing the insects or inhibiting their attack, insecticides protect the crops from the insects. They assist in bringing the pest population under the required threshold. They can be further classified based on their mode of action:

Contact Insecticides: These kill insects on direct contact with leaves and no residual activity, hence causing minimal environmental damage.

Systemic Insecticides: These are absorbed by the plant tissues and destroy insects when they feed on the plant. These are usually associated with long-term residual activity [2].

The study was carried out with the following objectives:

- To study the socio-economic profile of farmers
- To study the factors affecting purchasing behavior of farmers toward insecticide
- To study the problems faced by farmers and dealers in relation to insecticide

RESEARCH METHODOLOGY

This study included farmers and dealers. The total sample size was 130 (100 farmers and 30 dealers) respondents. Non-probability sampling method was used for sample selection. The samples were collected purposively from those farmers and dealers who were associated with insecticide. Farmers those were cultivating green gram and black gram were selected in this survey and dealers selling insecticide were taken. The semi-structured schedule was used for the survey. The study was conducted in Keshod taluka in Junagadh district of Gujarat. Analytical tools used in this study were Percentage, Henry Garrett ranking, and weighted average mean.

ANALYTICAL TOOLS

For socio-economic profile study tabular analysis was conducted. One of the simplest methods used to analyse the data and to display the data is in tabular form. In the tabular form, you get a systematic arrangement of rows and columns. The first column is used to indicate the titles and the first row is also used to indicate the same.

Weighted average mean was used to study the factors influencing purchasing behavior of farmers toward insecticide

Weighted Average Mean:

The Likert scale was used to analyse the variables affecting insecticide purchase decisions. The respondents' completed schedules were all collected, and the total responses for each item were totalled and calculated. A weighted mean was generated for each question to reflect it in the Likert-scale, which was then used for interpretation. Each number has to be multiplied by its weight in order to calculate the weighted mean. The total worth of the products should then be calculated. The sum of all the weights should have been used to calculate the overall weight. Next, divide the entire value by the total weight. The weighted mean was obtained statistically using the following formula:

Weighted Average Mean (X) = (F1X1 + F2X2 + F3X3 + F4X4 + F5X5) / Xt

Here,

F = Weight given to each response

X= Number of responses and Xt= Total number of responses

The problems faced by farmers and dealers were studied using Garrett's Ranking Technique and converted into numerical scores. The main benefit of this method over a straightforward

frequency distribution is that the limitations are ranked according to respondents' perceptions of their seriousness.

Henry Garrett ranking Technique was given by Henry Edward Garrett in 1969.

Formula is as per given below:

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

Here, Rij is called as rank given for the ith variable by jth respondents.

Nj is called as number of variables ranked by jth respondents.

RESULTS AND DISCUSSION

The results of the study were presented and discussed in four sections i.e., socio economic status of farmers, factors consider while purchasing insecticide, problems faced by farmers while purchasing insecticide and problems faced by the dealers. Out of 130 respondents 100 were farmers and they were surveyed for the socio-economic profile study, factors affecting while purchase of insecticide as well as problems faced. In this survey also 30 dealers were taken to study the problems faced by them with insecticides.

SOCIO ECONOMIC STATUS OF FARMERS

The socio-economic status of farmers refers to the social and economic conditions in which farmers live and operate. It encompasses various factors that influence their livelihoods, well-being, and overall quality of life. Understanding the socio-economic status of farmers is crucial for identifying and addressing their specific needs and challenges. Several key aspects contribute to understanding the socio-economic status of farmers were:

Table 1: Age of the respondents

Age (Year)	No. of Respondents
Below 20	8
21-40	27
41-60	40
61-80	20
Above 80	5
Total	**100**

(Source: Field Survey, 2023)

From Table 1 it was observed that out of the total 100 respondents, the majority large number of farmers fall within the 41 to 60 age group, accounting for 40 individuals. The 21 to 40 age group was the second largest with 27 respondents. The below 20 years and 61 to 80 years of age groups consist of 8 and 20 respondents, respectively. The smallest age group was above 80, comprising 5 respondents. This data suggests that the surveyed population was predominantly middle-aged, while the younger and older age groups were less represented. It provides insights into the age demographics of the respondents and can be used for various analyses and decision-making processes.

Table 2: Family size

No. of Family Members	No. of Respondents
2-4	9
5-7	32
8-10	37
>10	22
Total	**100**

(Source: Field Survey, 2023)

According to the provided data in Table 2, the family size distribution among the 100 respondents can be summarized as follows. 37 respondents belong to families with 8 to 10 members. The next largest group consists of 32 respondents who come from families with 5 to 7 members. Nine respondents were from families with 2 to 4 members, while 22 respondents were from families with more than 10 members. This data indicates that larger families with 5 or more members were more prevalent among the surveyed population, with families in the 8 to 10-member range being the most common. Smaller families with 2 to 4 members were less represented in this sample.

Table 3: Farming experience

No. of Years	No. of Respondents
Less than 10	10
11-20	28
21-30	37
31-40	15
More than 40	10
Total	**100**

(Source: Field Survey, 2023)

Based on the given data in Table 3, it can interpret the distribution of respondents based on their farming experience in years. Out of the 100 respondents, 10 individuals had less than 10 years of farming experience. The majority, 37 respondents, had a farming experience of 21 to 30 years, followed by 28 respondents with 11 to 20 years of farming experience. 15 respondents had 31 to 40 years of farming experience, while another 10 respondents had more than 40 years of farming experience. This data suggests that the surveyed population was diverse in terms of farming experience, with a significant number having over two decades of experience. It showcases the range of expertise and knowledge among the respondents.

Education Level	No. of Respondents
Illiterate	9

Table 4: Education level

Up to primary	25
SSC	25
HSC	27
Graduate & above	14
Total	**100**

(Source: Field Survey, 2023)

Table 4 represents the distribution of respondents based on their education level. Out of the 100 respondents, 9 individuals were classified as illiterate, indicating no formal education. The largest group, comprising 27 respondents, had completed their HSC. Both up to primary and SSC categories consist of 25 respondents each. Additionally, 14 respondents were classified as Graduate & above, representing individuals with a higher level of education. This data showcases the educational diversity among the surveyed population, with a significant number of respondents holding at least an HSC qualification. The distribution highlights varying levels of educational attainment among the respondents.

Table 5: Size of land holding

Landholding Size	No. of Respondents
Marginal	30
Small	32
Semi-medium	14
Medium	10
Large	14
TOTAL	**100**

(Source: Field Survey, 2023)

The given data in Table 5 presents the distribution of respondents based on the size of their land holdings. Out of the 100 respondents, the largest group consists of small landholders with 32 individuals, followed closely by marginal landholders with 30 respondents. Semi-medium landholders represent 14 respondents, while medium landholders account for 10 individuals and large landholders account for 14 individuals. This data suggests that the surveyed population comprises a diverse range of landholding sizes, with a significant proportion falling under the marginal and small categories. The presence of semi-medium, medium, and large landholders indicates a mix of different scales of agricultural operations among the respondents. The data provide insights into the landholding patterns within the surveyed population.

Table 6: Annual income of respondents

Annual Income (Rs.)	No. of Respondents
< 1 lakh	5
1-5 lakh	29
6-10 lakh	39
>10 lakh	27
Total	**100**

(Source: Field Survey, 2023)

As per Table 6, Out of the 100 respondents, 5 individuals had an annual income of less than 1 lakh rupees. The large number, with 39 respondents, falls within the income range of 6 to 10 lakhs rupees. The next largest group comprises 29 respondents with an annual income between 1 to 5 lakhs rupees. Additionally, 27 respondents had an annual income greater than 10 lakhs. This data indicates a diverse income distribution among the surveyed population, with a significant number earning between 1 to 10 lakhs rupees. The presence of respondents with higher incomes suggests a subset of individuals with comparatively higher financial well-being.

FACTORS CONSIDER WHILE PURCHASING INSECTICIDE

When purchasing insecticides, several factors should be considered to make informed decisions. These factors considered while purchasing insecticides and can help farmers to make informed choices, optimize pest management practices, minimize potential risks, and maximize crop health and productivity. So here it was studied in order to find out the impact of various factors.

Table 7: Factors consider while purchasing insecticide

Factors	WAM	Rank
Packaging available in different volume	3.36	7
Low price	3.47	2
Result is better than its competitors	3.19	9
Past experience	3.54	1
Promotional activity of the company	3.2	8
Brand image of company	3.4	4
Distributor and dealer recommendation	3.38	6
After-sales service	2.9	11
Credit availability	3.43	3
Timely availability	2.88	12
Long-term and positive effects on crop	3.07	10
Increase the productivity of the crop	2.65	15
Farm demonstration or trial plot result	3.39	5
The annual income of the farmer	3.4	4
Stage of crop growth	2.74	13
Weather conditions	2.7	14

(Source: Field Survey, 2023) The Table 7 presents a list of factors related to

agricultural products or services along with their corresponding weighted average mean scores and ranks. The factors are ranked based on their perceived importance by the respondents.

According to the data, the top-ranked factor was past experience with a WAM score of 3.54, which indicate that the respondents consider their past experience with a product or service as highly influential in their decision-making process. The second most important factor was low price with a WAM score of 3.47, highlighting the significance of affordability. The factor packaging available in different volume was in third rank with WAM score of 3.43.

Factors like brand image of company, and annual income of farmer shared the fourth rank, each with a WAM score of 3.40. These factors suggest that respondents value varied packaging options, the reputation of the company.

On the other hand, factors such as timely availability (ranked 12th), stage of crop growth (ranked 13th), and weather conditions (ranked 14th) and increase the productivity of the crop (ranked 15th) were considered to be of relatively lesser importance by the respondents.

These rankings provide insights into the factors that farmers prioritize when making decisions related to purchasing of agricultural products or services. It suggests that factors like past experience, price, credit availability, brand image, and recommendations of distributors and dealers play significant roles in influencing their choices.

PROBLEMS FACED BY FARMERS WHILE PURCHASING INSECTICIDE

Farmers face several problems while purchasing insecticides. One issue is the relatively high price, which can strain their limited financial resources. They also often encounter challenges with after-sales service and may struggle with poor quality products. The fear of adulteration is another concern, as farmers need assurance of the authenticity and effectiveness of the insecticides. Lack of discounts, high interest rates on credit, and limited availability of credit can further hinder their purchasing decisions. Timely availability of insecticides, appropriate packaging sizes, and unavailability of preferred brands add to the list of challenges farmers face when buying insecticides [3]. These factors were surveyed under this objective.

Table 8: Problems faced by farmers

Factor No.	Factors	Average Garrett Score	Rank
F1	Relative high price	64.25	1
F2	After sales service	57.80	2
F3	Poor Quality of Products	44.64	8
F4	Fear of adulteration	55.67	3
F5	No discount	52.27	7
F6	High Interest of Credit	54.04	5
F7	Lack of credit availability	54.37	4
F8	Timely availability	22.17	10
F9	Packaging size	52.98	6
F10	Preferred brand is not available	40.16	9

(Source: Field Survey, 2023)

The provided data represents various factors, associated problems, average Garrett scores, and ranks based on those scores.

The factor relative high price ranks first with an average Garrett score of 64.25, indicating that respondents perceive the high price as a significant problem. After sales service ranks second with a score of 57.80, suggesting that respondents value good after-sales support.

The problem of poor quality of products ranks eighth, indicating that respondents find it to be a concern but less impactful compared to other factors. fear of adulteration ranks third, indicating the importance of product authenticity and safety.

Issues such as the lack of credit availability, absence of discounts, high interest rates on credit, lack of credit availability, and packaging size were also significant concerns for farmers, ranking from fourth to seventh.

Similarly, non-availability of preferred brand ranks ninth, indicating the preference for specific brands. Timely availability ranks tenth, suggesting that respondents were less concerned about the timely availability of the product.

The data provides insights into the problems faced by respondents and their relative importance. High prices, after-sales service, and product adulteration were identified as the top concerns. On the other hand, factors like packaging size and timely availability have relatively lower impact on respondents' decision-making.

PROBLEMS FACED BY THE DEALERS

This objective includes the challenges and difficulties encountered by dealers who are involved in the distribution and sale of insecticides. These problems can vary depending on various factors, including the market conditions, competition, and the nature of the agricultural industry. Here some common problems faced by dealers were surveyed.

Table 9: Problem faced by dealers

Factor No.	Factors	Average Garrett Score	Rank
F1	Large Number of Brands	54.30	2
F2	High Competition	55.63	1
F3	Inadequate Transportation Facility	52.90	4
F4	High Taxes	52.47	5
F5	Low Margin	53.27	3
F6	Government Interference	35.50	7
F7	Booking Policies of Company	48.00	6

(Source: Field Survey, 2023)

The given data presents various factors, associated problems, average Garrett scores, and ranks based on those scores.

The factor high competition ranks first with an average Garrett score of 55.63, indicating that respondents perceive it as the most significant problem. This suggests that the competitive environment poses challenges for the respondents in their business operations.

The problem of large number of brands ranks second with a score of 54.30, implying that respondents find it difficult to navigate through a wide range of brands available in the market. This highlights the issue of choice overload and the need for brand differentiation.

Factors such as low margin, inadequate transportation facility, and high taxes secure ranks between three and five, highlighting their impact on the profitability and logistics of the respondents' businesses.

The factors booking policies of company and government interference rank sixth and seventh, respectively, indicating that respondents face challenges related to company policies and government regulations in their business operations.

The data provides valuable insights into the problems faced by respondents in their business environment. High competition, a large number of brands, and logistical limitations are identified as the top concerns. The rankings help in understanding the relative importance of each factor, assisting in decision-making processes and identifying areas for improvement to address the challenges faced by the respondents.

CONCLUSION

Large number of farmers surveyed were between 21 and 60 years old. The family sizes varied, with a significant portion having 8 to 10 members. Education levels varied, with 14 per cent of farmers being graduates and above. Landholding sizes varied, with a notable percentage having less than 1 hectare. Annual incomes varied, with a significant portion earning between 6 to 10 lakhs. These demographic factors play a crucial role in farmers' purchasing patterns and decision-making processes. Factors such as past experience, low price, credit availability, and brand image of the company rank higher, indicating their influence on decision-making. Factors like stage of crop growth, weather conditions and increase in productivity of crop rank lower in their impact on the decision-making process. In case of problems faced by farmers the factors relative high price and after sales service rank first and second, indicating their significant impact. Other factors such as fear of adulteration, lack of credit availability, high interest of credit, and packaging size also play important roles in the respondents' decision-making processes. In case of problems faced by dealers the factors high competition and large number of brands rank first and second, indicating their significant impact, followed by other factors such as low margins, transportation facility, high taxes, booking policies and government interference.

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