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Farmers' purchasing behaviour towards fungicide for groundnut crop in Maliya Hatina Taluka of Junagadh district, Gujarat

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Abstract

Agriculture is a key sector in India, employing the majority of the population and contributing significantly to the economy. Agrochemicals, including pesticides and fertilizers, play a vital role in enhancing crop productivity. However, their overuse poses environmental and health risks. The global agrochemicals market is projected to reach USD 282.2 billion by 2030, with Asia-Pacific leading the market share. In India, the industry is valued at around USD 6 billion, with insecticides being the dominant segment. To understand farmers' purchasing behaviour towards Fungicide for Groundnut Crops in Maliya Hatina Taluka of Junagadh District, Gujarat, a study was conducted, revealing that most farmers were in the age group of 41-50 and the majority of them are male, having 21-30 years of farming experience and education level was below SSC. Farmers engaged in both agriculture and livestock farming were higher, with annual incomes between 1-4 lakhs and semi-medium type of farmers. The study reveals that factors like results were better than competitors. Credibility and distributor recommendations significantly influenced farmers' purchasing decisions. Farmers showed concerns regarding high prices, lack of credit availability, and lack of discounts for product purchasing decisions. Dealers also encountered challenges including low margins and payment issues. Demonstrations, farmer meetings, and recommendations hold the highest importance in promotional activities. Understanding farmers' behaviour and addressing their concerns can enhance the adoption and distribution of fungicides. This study provided valuable insights into farmers' practices and the significance of effective promotions measures in the agri-input sector.

Keywords: Fungicide, groundnut crop, purchase behaviour, promotional strategy

Introduction

Agriculture is the key sector in the development of the country, India, employing more than two-third of the population, directly or indirectly (World Bank, 2022) ^[8]. The sector has evolved significantly, contributing 20.2 percent to the Gross Value Added product of the economy (National Statistical Office, 2022) ^[6]. Agrochemicals, also known as agrichemicals, are chemical substances used in agriculture for various purposes. They include pesticides (insecticides, herbicides, fungicides, rodenticides, molluscicides, and nematocides), fertilizers, soil conditioners, algacides, and liming/acidifying agents (Chaudhary *et al.*, 2022) ^[1]. These chemicals aid in controlling pests, weeds, diseases, promoting plant growth, and improving soil quality. Their use can enhance crop productivity, but it is an important to use them responsibly to minimize the environment and health (Rani *et al.*, 2021) ^[7]. The global agrochemicals market was valued at approximately US\$235.2 billion in 2021 and is projected to reach US\$282.2 billion by 2030, growing at a CAGR of 3.7 percent during the forecast period (Markets and Markets, 2023) ^[4]. The Asia-Pacific region holds the largest share of the agrochemical market, whereas the North American market is expected to demonstrate the highest growth rate (Markets and Markets, 2023) ^[4]. In India, the agrochemicals industry is valued at around USD 6 billion and is projected to grow at a CAGR of 8.5 percent until 2028 (IMARC Group, 2022) ^[3]. India accounts for 15 percent of the global agrochemical market and is the fourth largest producer in the world (FICCI, 2021) ^[2]. The industry's main segments include insecticides, fungicides, herbicides, and bio-pesticides. India's pesticide consumption has shown an overall increasing trend over the years (FICCI, 2021) ^[2]. These consumption trends reflect the emphasis on pest control and disease management in Indian agriculture, with factors such as pest pressures, weather conditions, and government policies influencing pesticide usage (MoA&FW, 2016) ^[5].

With this backdrop, it was tried to unveil a gap regarding purchasing behaviour of farmers and effectiveness of promotional activities on agri-input purchasing in Maliya Hatina Taluka of Junagadh District, Gujarat. For getting the desired information, other parameters like socio economic profiles of farmers, factors affecting purchasing behaviour, problems of farmers in product use, challenges faced by dealers and probable promotional strategy for gaining more visibility among the respondents in the study area.

Materials and Methods

The study aimed to address the problem statements and objectives through the implementation of a systematic research design known (Descriptive Research Design), and a non-probability sampling method (purposive sampling), was utilized in the process of sampling for the study. Both primary and secondary data were collected to fulfill the requirements

of the study. Primary data were obtained through a semi-structured schedule by conducting an interview, while secondary data were gathered from various private and government publications, literature, and research papers. The study area was majorly confined to Maliya Hatina Taluka of Junagadh district in Gujarat, known for its significant groundnut production. The identified taluka has a high concentration of groundnut farmers and was representative of groundnut cultivation during the kharif season. Different villages within the talukas were selected based on recommendations from dealers and company sales officers. The research instrument used in this study was a semi-structured schedule, allowing for accurate information collection from respondents. The analytical tools employed included descriptive statistics, tabular analysis, charts, graphical presentations, weighted average mean, and Henry Garrett Ranking.

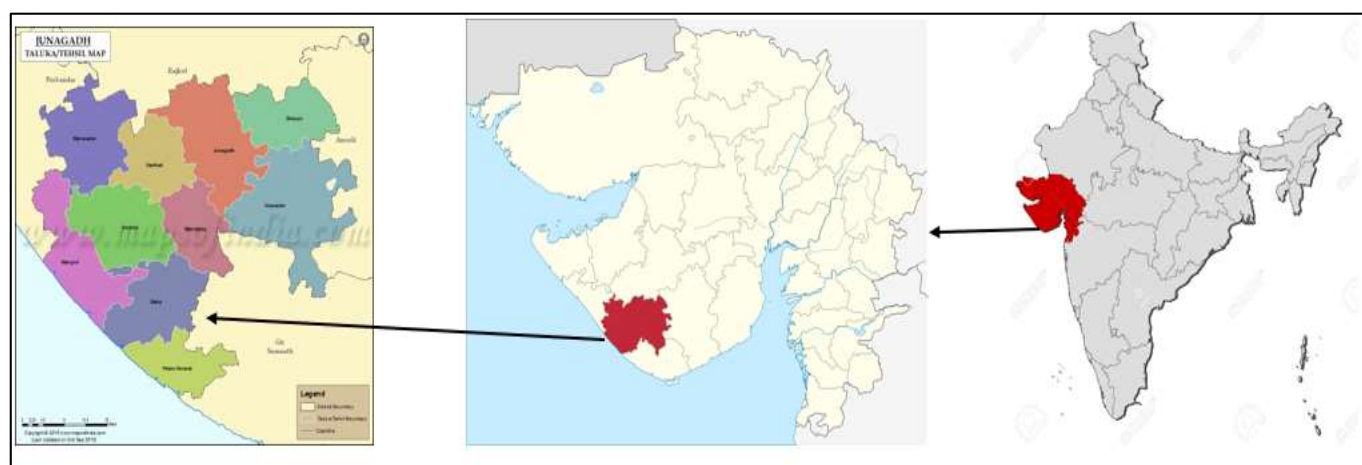


Fig 1: Study Area of the Groundnut Crop

Results and Discussion

A perusal of the table 1 revealed an overview of socio-economic parameters related to a targeted population. The majority of farmers in the study were in the age group of 41-50, comprising 60 percent of the sample. Young farmers below 30 constituted the smallest group at 6.67 percent of the total. Limited support, high costs, and low productivity may contribute to the lower representation of young farmers. Male farmers comprised 68.33 percent of the total, while female farmers accounted for 31.67 percent of them, indicating notable gender disparities in agriculture due to social norms and unequal resource access. Farmers with 21-30 years of experience constituted 51 percent of the total, while highly experienced farmers with over 30 years represented 27 percent in them, reflecting limited educational and economic opportunities that incentivized farming as a primary livelihood. Joint families constituted 56.67 percent of the total sample, reflecting cultural norms and strong family ties in rural agricultural households. Nuclear families represented 34.17 percent of the total, and extended families made up 9.16 percent of the total respondents. Approximately 54.17 percent of the farmers had educational levels below SSC, while 19.17 percent were illiterate, indicating limited formal education

among respondents. Around 55.83 percent of individuals were engaged in both agriculture and livestock farming, providing complementary income streams and opportunities for economic growth. The majority of the farmers had an annual income between 1-4 lakhs, with 25.84 percent earning between 3-4 lakhs, influencing agrochemical purchasing behavior. Semi-medium farmers were the largest group at 46.67 percent, followed by medium (19.16%), small (17.50%), marginal (12.00%), and large farmers (6.67%), with purchasing behavior varying based on farmer type. Approximately, 53.33 percent of the farmers had access to irrigated land, while 9.17 percent relied solely on rainfed land, posing challenges due to seasonal rainfall variability. Chemical methods were the most widely used (52.50%) for pest control, indicating the need for promoting sustainable alternatives such as IPM and biological control. Most farmers purchased fungicides from retailer shops (56.67%), followed by dealer shops (26.67%) and company stores (9.16%), highlighting preferences for convenience and product variety. About 60 percent of the farmers reported good results, 21.67 percent average results, and 18.33 percent poor results when using fungicides on crops, indicating the potential for improvement and the need for better guidance.

Table 1: Socio-economic profile of Maliya Hatina taluka farmers

	Parameter	Frequency	Percentage (%)
Age	Below 30	8	6.67
	31-40	24	20.00
	41-50	72	60.00
	Above 50	16	13.33
Education Level	Illiterate	23	19.17
	Below SSC	65	54.17
	SSC	16	13.33
	HSC	11	9.17
	Graduation and above	5	4.17
Gender Status	Female	38	31.67
	Male	82	68.33
Family Type	Nuclear	41	34.17
	Joint	68	56.67
	Extended	11	9.16
Farming Experience	Below 10	12	10.00
	11-20	14	11.67
	21-30	61	50.83
	Above 30	33	27.50
Occupation Status	Agriculture	32	26.67
	Agriculture, Livestock farming	67	55.83
	Agriculture, Enterprise	9	7.50
	Agriculture, Livestock farming, Enterprise	12	10
Annual Income	Below 1 lakh	13	10.83
	1-2 lakhs	28	23.33
	2-3 lakhs	26	21.67
	3-4 lakhs	31	25.84
	Above 5 lakhs	22	18.33
Type of Farmer	Marginal Farmer	12	10.00
	Small Farmer	21	17.50
	Semi-medium Farmer	56	46.67
	Medium Farmer	23	19.16
	Large Farmer	8	6.67
Land Holding	<1 ha	6	6
	1.00 to 2.5 ha	17	17
	2.5 to 5 ha	56	56
	> 5 ha	21	21
Types of Land	Irrigated	64	53.33
	Rainfed	11	9.17
	Both	45	37.50
Source of Irrigation	Open well	46	42.20
	Bore well	25	22.93
	Both	38	34.87
Method of Irrigation	Surface	31	28.44
	Sprinkler	16	14.68
	Drip	2	1.83
	Surface and Sprinkler	42	38.53
	Surface and Drip	13	11.93
	Surface, Sprinkler and Drip	5	4.59
Purchase Place of Fungicide	Dealer's shop	32	26.67
	Retailer's shop	68	56.67
	Company stores	11	9.16
	Any others	9	7.50
Used Fungicides Result on Crop	Good	72	60.00
	Average	26	21.67
	Poor	22	18.33

It was observed from the table 2 that farmers considered factors such as the fungicide's ability to give better results than competitors, its superiority over, distributors and dealer

recommendations, and credit availability when purchasing. Attributes related to product performance and credibility ranked higher, while factors like packaging, price, and

promotions hold moderate importance among the respondents. After-sales service and external factors have a lower influence on purchasing decisions. Agrochemical

companies should emphasize product performance and competitive advantages while addressing farmers' preferences for successful marketing.

Table 2: Factors Consider while Purchasing Fungicide for Groundnut

F	Attributes	SA	A	N	D	SD	Total	WAM	Rank
F1	Packaging available in different volume	16	22	39	27	08	112	3.10	11
F2	Low price.	28	35	24	14	11	112	3.49	7
F3	Increase the productivity of the crop	31	34	32	10	05	112	3.68	4
F4	Past experience	22	39	27	18	06	112	3.47	8
F5	Promotional activity of the company	19	40	23	21	09	112	3.35	9
F6	Brand image of the company	36	41	07	16	12	112	3.65	5
F7	Distributor and dealer recommendation	45	31	12	18	06	112	3.81	2
F8	After sales service	07	13	23	37	32	112	2.34	16
F9	Credit availability	29	43	21	15	04	112	3.70	3
F10	Timely availability	15	33	30	21	14	112	3.15	10
F11	Long-term and positive effects on crop	07	15	46	19	24	112	2.63	15
F12	Result is better than its competitors	27	35	47	09	02	112	3.89	1
F13	Farm demonstration or trial plot result	25	38	30	11	08	112	3.54	6
F14	An annual income of a farmer	09	24	51	17	11	112	3.03	12
F15	Stage of crop growth	03	32	44	18	15	112	2.91	13
F16	Weather conditions	06	22	37	28	19	112	2.71	14

[F-Factor, SA (Strongly Agree)-5, A(Agree)-4, N(Neutral)-3, D(Disagree)-2, SD (Strongly Disagree)-1, WAM- Weighted Average Mean]

It was observed from the table 3 that problems faced by farmers when purchasing Fungicides revealed that high prices, lack of credit availability, absence of discounts, and high interest rates were the most significant concerns. Other issues included timely not available, fear of adulteration, poor

product quality, packaging size, preferred brand unavailability, and after-sales service. Addressing these problems can enhance farmers' trust and increase the adoption of Fungicides.

Table 3: Problems Faced by Farmers in Relation to Fungicide

Factor	Attributes	Garrett Score	Average Garrett Score	Rank
F1	Relative high price	7240	64.64	1
F2	Lack of Credit availability	6541	58.40	2
F3	No discount	6285	56.12	3
F4	High interest on credit Borrowing	6229	55.62	4
F5	Timely not available	6039	53.92	5
F6	Fear of adulteration	5976	53.36	6
F7	Poor quality of products	5602	50.02	7
F8	Packaging Size	4590	40.98	8
F9	Preferred brand is not available	3903	34.85	9
F10	After sales service	3595	32.10	10

It was observed from the table 4 that problems faced by dealers when purchasing fungicides revealed that low

margins, payment issues, booking policies, and high taxes were the most significant concerns.

Table 4: Problems Faced by Dealers in Relation to Fungicide

Factor	Attributes	Garrett Score	Average Garrett Score	Rank
F1	Low Margin	1467	73.35	1
F2	Payment Issues	1290	64.50	2
F3	Booking policies of the company	1176	58.80	3
F4	High taxes	1127	56.35	4
F5	High Competition	1021	51.05	5
F6	A large Number of Brands	960	48.00	6
F7	Government interference	862	43.10	7
F8	High cost of transportation	758	37.90	8
F9	Inadequate transportation facility	754	37.70	9
F10	Lack of technical knowledge	585	29.25	10

Other issues included high competition, a large number of brands, government interference, high transportation costs, inadequate transportation facilities, and lack of technical knowledge created problems for the dealers. Addressing these problems can improve dealer satisfaction and enhance the distribution network for Fungicides.

The effectiveness of promotional activities on the agri-input purchasing revealed that demonstrations, farmer meetings, and recommendations from retailers and friends hold the highest significance. Social media advertisements and exhibitions were also considered effective, while TV advertisements ranked lower in the promotional level criteria

(table 5). Activities such as leaflets, posters, van campaigns, and wall paintings had moderate effectiveness in the promotional activities. Companies should prioritize impactful

demonstrations, farmer meetings, and fostering relationships with retailers and friends to enhance promotional efforts.

Table 5: Effectiveness of Promotional Activities on the Agri-Input Purchasing

A	Activities	HE	E	N	IE	HI	Total	WAM	Rank
A1	TV Advertisement	22	39	18	16	17	112	3.29	8
A2	Social media Advertisement	36	31	34	6	5	112	3.78	6
A3	Leaflets	19	24	19	38	12	112	3.00	11
A4	Posters	20	26	33	19	14	112	3.17	10
A5	Demonstration	71	22	11	8	0	112	4.39	1
A6	Farmer meeting	64	34	7	3	4	112	4.35	2
A7	Van campaign	33	27	28	21	3	112	3.59	7
A8	Wall painting	21	29	31	16	15	112	3.22	9
A9	Exhibition	37	29	32	13	1	112	3.79	5
A10	Farmers/friend's suggestion	54	31	11	5	11	112	4.00	4
A11	Retailers' suggestion	62	29	8	7	6	112	4.20	3

[A-Activity, HE(Highly Effective)-5, E(Effective)-4, N(neutral)-3, IE(Ineffective)-2, HI(Highly Ineffective)-1, WAM- Weighted Average Mean]

Conclusion

The study area is dominated by small and medium categories of farmers having medium age groups, dominated by males, having senior secondary level education level, and getting the major source of income from the agriculture and livestock sector. The ability to give better results than competitors, advice of dealers and distributors, and the availability of credit are some of the major factors that influence purchase decisions among farmers. These factors take precedence over others in farmers' decision-making process. High pricing, limited credit options, the absence of discounts, and elevated interest rates are the major bottleneck in the farmers' communities for not using the products. Even, inadequate profit margins, payment complications, unfavourable booking policies, and burdensome taxation are found as the challenges among the dealers point. The significance of promotional activities, with demonstrations, farmer meetings, and recommendations of retailers and friends are some of the impactful activities for the farmers in their respective fungicide use. Even, they also value social media advertisements and exhibitions for taking any information in the study area.

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