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Research Article

MARKET POTENTIAL OF SELECTED AGRICULTURAL PRODUCTS AND PROBLEM IDENTIFICATION OF GROUNDNUT CULTIVATION IN KHAMBHALIYA EAST MARKET OF DEVBHOOMI DWARKA DISTRICT

RADADIYA A. AND LAD Y.*
Department of Human Resource Development, International Agribusiness Management Institute, Anand Agricultural University, Anand, 388 110, Gujarat, India
*Corresponding Author: Email - yogeshalad@gmail.com, yalad@aau.in

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Abstract: The study has covered selected villages of Khambhaliya taluka in Devbhoomi Dwarka district selected through convenience sampling method. Both primary and secondary data were used to achieve the stipulated objectives of the study. Primary data were collected with the help of a semi-structured schedule. Descriptive statistics, Garrett ranking, Likert scale, Tabular analysis, and Correlation analysis were applied to achieve the stipulated objectives of the study. The majority of respondents have an age between 40 to 55 years followed by 25 to 40 year the majority of respondents studied up to SSC and the majority of respondents earn income between 1 to 5 lakhs. Major problems faced by the farmer during groundnut cultivation are the cost of input & insect attacks followed by uneven/less germination, rust and tikka disease, and so on. In the study area, the Market potential of Imivax (seed treatment product) was 29.9 lakh, battalion FS (seed treatment product) 23.2 lakh, Delma (fungicide) 56.4 lakh and, for Wuxal (micronutrient) 1.12 cr. According to research, most of the farmers got influenced for the purchase of any pesticide product through different promotional strategies like demonstrations, retailer suggestions & farmers' meetings.

Keywords: *Market Potential, Promotional Strategies, Problem faced by farmers, Plant protection measures, Groundnut*

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Introduction

Indian economy is largely agrarian based in nature. The share of agriculture in GDP increased to 19.9 per cent in 2020-21 from 17.8 per cent in 2019-20. Agriculture development in the 21st century faces some unprecedented challenges with steady growth in the world population. The increasing population exercises more pressure on the limited net cultivated area of 140.02 million hectares to produce the needed quantity of 240 to 250 million tons of food grains. This necessitates ensuring timely and increased availability of critical inputs like fertilizers, pesticides, machinery, hybrid seed, and improved packages of practices to the farmers for the increased production of food grains and vegetables. The agrochemicals industry is a significant industry for the Indian economy.

The global agrochemicals market is anticipated to develop at a CAGR of 2.7% from 2022 to 2030, reaching an estimated value of USD 223.49 billion in 2022 and USD 280.87 billion by 2030. The Indian agrochemical industry is valued at around USD 5.72 billion in the financial year 2020-21, out of which domestic consumption is approximately USD 2.72 billion, while export is around USD 3.00 billion.

The world pesticide industry market size was $ 8.1 billion (2022). SF, Bayer AG, Syngenta, Sumitomo Chemical, UPL, Adama, Kumiai Chemical Industry, Nissan Chemical, Nufarm, and Jiangsu Yangnong Chemical are a few of the top companies in the world's pesticides market. The Indian pesticides market reached a value of around ₹ 212 Billion in 2021. Looking forward, IMARC Group expects the market to reach ₹ 320 Billion by 2027, exhibiting a CAGR of 7.07%. In India, there are about 150 industrial units manufacturing pesticides and about 500 industrial units engaged in formulations in the country. Per hectare, consumption of pesticides is low in India at 600 grams compared to the world average of 3000 grams.

The global fertilizer market amounted to more than 193 billion U.S. dollars in 2021, an increase of roughly 12 percent in comparison with the previous year. It is forecast that the fertilizer market will surpass 240 billion U.S. dollars by 2030. The Indian fertilizer market reached a value of ₹ 858 billion in 2021.

Looking forward, IMARC Group expects the market to reach ₹1,131 billion by 2027, exhibiting a CAGR of 4.8% during 2022-2027. Fertilisers contributed vital role in the success of India's green revolution and eventual self-sufficiency in food grain production. Increased fertiliser consumption has substantially contributed to the country's sustainable production of food grains. As a result, the demand for fertilizers has witnessed double-digit growth rates over the past several years.

Literature Review

Kankarne *et al.* (2017) [1] suggested that the chances of success of any product of a company depend on the socio-economic profile of farmers, their knowledge regarding management practices, and the relationship between them. The majority of respondent belonged to the medium category in terms of age, education, annual income, risk orientation & source of information. It may be concluded that source of information, risk orientation, education, and income will lead to significant change in knowledge level of farmers.

Kumari & Basavaraja (2017) [2] studied that, the majority of the farmers got the information about pesticides from the pesticide dealers, so they suggested that the farmers should be encouraged to obtain information on the optimum quantity of pesticide use from agricultural universities and extension workers. Awareness needed to be created on the use of personal protective measures among farmers while handling pesticides.

Patel & Lad (2018) [3] studied that Total area under tomato crop in Anand district was 830 acre. Average quantity required per ha was as per below table and price was also mentioned in table. Thus, Rs. 24, 98,300 is market potentiality in Anand district in tomato crop.

Patel & Lad (2019) [4] the major crops grown in the study area were tobacco, wheat, pearl millet, tomato and paddy. The company's product Narkis has a decent annual market potential worth Rs. 7.66 crores for paddy crop which gives a clear indication of better business opportunities for the product.

Farmers are mostly preferred PI industry's product as it was a pioneer in that area from last 4-5 years. Farmers got the information of the products from dealers, demonstration, meeting and different media like electronic media, printing media etc. Dealers play an important part in purchasing any input. So, the company should have built trustworthy relation with dealers. The satisfaction level of the farmers was depending on different factors *i.e.,* quality, price, packaging size, and availability of the product.

Jalu *et al*. (2022) [5] studied multistage, purposive, and random sampling techniques in Saurashtra region of Gujarat state with the sample size of 160 farmers revealed that major problems faced by the farmers in adopting the recommended groundnut crop production technology were high price of improved seeds (92.50%), low production due to pest and disease infestation (88.75%), yellowing, labour shortage and high wages of labour.

Mishra *et al.* (2022) [6] reported that promotion was influenced by many factors and it affected many other things mostly the purchasing behaviour of the farmers. Due to advertising campaigns, farmers were aware of the various brands and companies. The most desired media by the farmers was found out be pamphlets, brochures, newspapers, and magazines. Sales promotion in agrochemicals was a key ingredient in marketing. Sales promotions such as demonstrations, field trails, and get-togethers were growing up fast to attract farmers to buy their products.

Objectives of the study

To study socio-economic profile of farmer

To identify problems faced by farmer during crop cultivation in groundnut

To study market potential of Imivax, Battalion FS, Delma and Wuxal products in groundnut

To study effective promotional tools for scaling up the use of company products

Material and Methods

The study was carried out during 1st June 2022 to 30th July 2022 in Khambhaliya taluka of Devbhoomi Dwarka district of Gujarat. A total 5 villages from the Khambhaliya taluka were selected. A sample of 150 farmers was drawn from 5 villages were selected. I have taken data for Kharif Groundnut only. Primary survey was carried out with the help of structured schedule. Secondary data were collected from Literature, Private and Government publications and Websites. Considering the nature of study as well as for obtaining correct information from the respondent, it was decided to collect information though semi structured schedule prepared with the help of available related literature and research report. In this research paper, Descriptive research study method has been adopted that is used to describe the characteristics of the sample population, situation or phenomenon to be studied. For data presentation Frequency Analysis and pie charts are used. For data analysis Garrett ranking method, Likert scale and correlation analysis method used [7]. Market potential of selected agricultural products were examined with the use of following formula:

*Mp = A(acre)*D(per acre)*P(₹)*

Where, A = Total area under groundnut

D = Dose/acre (kg/acre)

P = Price of the product (₹/kg)

Results and discussions

Age of the respondents

The study revealed that in selected villages of Khambhaliya taluka of Devbhoomi Dwarka district, the age of farmers is very important demographic factor that influences the purchasing pattern and decision-making process. According to the survey, there were 58% of farmers between 40-55 years, so we can say that the middle age people were predominant in the region. The elderly farmers *i.e*., who were above 55 years comprised 14%, young farmers *i.e*., 25-40 years were 40%. Farmer's literacy means they can do their job with full knowledge and it helps in farming activities. They can read market conditions and improve their knowledge.

Age (years)	Frequency (n)
Below 25	9
25-40	40
40-55	87
>55	14

Education level of the respondents

The study revealed that 8 % of respondents were illiterate, 25% of respondents had taken education up to primary level, 35% of respondents had taken education up to SSC, 22% of respondents had taken education up to SSC however, around 10 % of farmers were graduates. The number of graduates & HSC must increase to bring about technological development and new farming activities.

Education level	Frequency (n)
Illiterate	13
Up to primary	37
SSC	52
HSC	33
Graduate	15

Landholding capacity of the respondents

The land holding of the farmers is crucial as it decides the consumption of agro-inputs and the risk bearing ability of the farmer. According to the survey, it was found that farmers have, 19% farmers have land between 0 to 1 ha, 40% of farmers have land between 1 to 4 ha, 27% of farmers have land between 4 to 10 ha and the remaining 14% of farmers have land above 10 ha in the study area. It shows that the majority of respondents were small and semi-medium farmers.

Total Land Holding (ha)	Classification of farmers	No. of farmers (n)
0 to 1	Marginal	28
1 to 4	Small	60
4 to 10	Medium	41
Above 10	Large	21

Income level of the respondents

In the study area, it is revealed that majority of farmers *i.e*., 37% had income between 1-5 lakh followed by 29% farmers had income between 5 -10 lakh.

Annual Income	Frequency (n)
< 1 Lakh	29
1-5 Lakh	55
5-10 Lakh	43
>10 Lakh	23

Correlation between land holding and annual income

From the correlation analysis, it is concluded that as the land holding increase, annual income of farmer can increase at highly significant level or it can be near to perfect positive.

The study revealed that in the Kharif season, most farmers had sown groundnut crop while some farmers sown cotton. In Rabi season, most farmers have sown cumin or coriander or chickpea on their farm. In the summer season, farmers have sown fodder sorghum or maize crop on their fields while sometimes they keep their land fallow instead of growing any crop.

		Land holding	Annual income
Land Holding	Pearson Correlation	1	0.917**
	Sig. (2-tailed)		0.0
	N	150	150
Annual income	Pearson Correlation	0.917**	1
	Sig. (2-tailed)	0.0	
	N	150	150

Irrigation source used by the respondents

In the study area, it is revealed that majority of farmers use well as a source of irrigation *i.e.,* 73% followed by 27% of farmers use tube well as source of irrigation.

Source of Irrigation	No. of farmers (n)
Well	109
Tube well	41

Correlation between land holding and irrigation source

From the correlation analysis, it is concluded that as the land holding increase, the source of irrigation decreases at a highly significant level. According to a survey, it was found that the majority of farmers *i.e*., 66 % have depended on agricultural activity for earning income while the remaining 34% of farmers have depended on agriculture as well as livestock-related activity for earning income.

		Land holding	Irrigation source
Land Holding	Pearson Correlation	1	-0.334**
	Sig. (2-tailed)		0.0
	N	150	150
Irrigation source	Pearson Correlation	-0.334**	1
	Sig. (2-tailed)	0.0	
	N	150	150

Problems faced by respondents during crop cultivation in groundnut

The study revealed that the majority of farmers faces problems during groundnut cultivation were the cost of input and insect attack followed by uneven/less germination, rust & tikka disease, wilting, yellowing, low quality seed, labour, seed rot and mechanization.

Problems	Garrett Score	Mean Score	Rank
Cost of input	11943	79.62	1
Insects Attack	10654	71.02	2
Uneven/less germination	9470	63.13	3
Rust & Tikka disease	8685	57.9	4
Wilting	7806	52.04	5
Yellowing	7140	47.6	6
Low quality seed	6218	41.45	7
Labour	5401	36	8
Seed rot	4383	29.22	9
Mechanization	3040	20.26	10

Market Potential of Selected agricultural Product

The study revealed that in the study area, the Market potential of Imivax (seed treatment product) was 29.9 lakh, for battalion FS (seed treatment product) 23.2 lakh, for Delma (fungicide) 56.4 lakh, and for Wuxal (micronutrient) 1.12 cr.

Product	Dose	Area (acre)	Price	Market Potential	Market Potential (₹)
Imivax	3 g/kg	11,078	1800/kg	1661.7 Kg	29.9 Lakh
Battalion FS	3 ml/kg	11,078	1400/L	1661.7 L	23.2 Lakh
Delma	0.6 kg/acre	11,078	850/0.6 Kg	6646.8 Kg	56.4 Lakh
Wuxal Macromix	750 ml/acre	11,078	1350/L	8308.5 L	1.12 Cr

Seed Treatment products used by respondents

Seed treatment plays an important role in protecting the seeds and seedlings from seed and soil-borne diseases and insect pests affecting crop emergence and growth. Most farmers utilized seed treatment because of its number of benefits like improving seed germination, providing protection against pests and diseases as well as increasing the yield. The study revealed that most respondents *i.e.*, 83% used seed treatment. In the study area, most farmers were utilizing Gaucho product of Bayer company as a seed treatment, due to its systemic activity and relatively low rate of application makes it user friendly for seed dressing

Seed Treatment Products	No. of Farmers (n)
SWAL Products	11
Gaucho (Bayer)	43
Vitavax (Dhanuka)	23
Indofil M-45	19
Gaucho (Bayer), Indofil M-45	18
Vitavax (Dhanuka), Indofil M-45	2
Not known	9

Correlation between seed treatment use and land holding/education

		Land holding	Seed treatment use
Land Holding	Pearson Correlation	1	0.345**
	Sig. (2-tailed)		0.0
	N	150	150
Seed treatment use	Pearson Correlation	0.345**	1
	Sig. (2-tailed)	0.0	
	N	150	150

		Education	Seed treatment use
Education	Pearson Correlation	1	0.162*
	Sig. (2-tailed)		0.047
	N	150	150
Seed treatment use	Pearson Correlation	0.162*	1
	Sig. (2-tailed)	0.047	
	N	150	150

From the correlation analysis, it is concluded that as the land holding increase, use of seed treatment increases significantly & also concluded that as the education level increase, use of seed treatment increase significantly.

Fungicide used by the respondents

The study revealed that majority of farmers utilized Delma ad Turf product of SWAL company as fungicide product, indicating SWAL company dominating in this sector. Apart from SWAL products farmers utilized contaf plus of TATA Rallis, Cabrio Top of BASF company, Custodia of ADAMA company.

Fungicide	No. of Farmers (n)
Delma (SWAL)	46
Contaf Plus (TATA Rallis)	29
Custodia (ADAMA)	9
Cabrio Top (BASF)	12
Prospell (COROMANDEL)	6
Turf (SWAL)	34
Not known	14

Micronutrient used by the respondents

Micronutrient promote the strong, steady growth of crops that produce higher yields and increase harvest quality – maximizing a plant's genetic potential. According to survey, in the study area around 61% of farmers utilized micronutrient application for their crops while 39% of farmers did not utilize such type of application on their field. In the study area, mostly farmers *i.e.*, 41% of farmer utilize Wuxal product of SWAL company as a micronutrient application due to its benefits like, boost and retain flowering, reduce flower dropping, crop can stand up against adverse weather condition, stabilize pH, compatible with most commonly used pesticides and reduce water hardness of the spray solution etc. From the correlation analysis, it is concluded that as the land holding increase, use of micronutrient increases significantly.

Micronutrient Solution	No. of Farmers (n)
Wuxal (SWAL)	38
Macarena (UPL)	22
Allwin Top Plus (SDS Romicides)	10
Fantac Plus (COROMANDEL)	12
Not known	9

Promotional tools influences farmers for purchasing

The study revealed that most of the farmers' influence for purchase of any pesticide product threw different promotional strategies like demonstrations, retailer suggestions & farmers' meetings. Apart from this, various other strategies like poster, farmer/friend suggestions, leaflets, TV advertisements, wall paintings, exhibitions, and jeep campaigns also affect the farmers' purchasing behaviour.

SN	Tools	Mean score	Result	Rank
1.	Demonstration	4.85	Extremely	1
2.	Retailer's suggestion	4.82	Extremely	2
3.	Farmer meeting	4.63	Extremely	3
4.	Poster	4.19	Very	4
5.	Farmer/Friend suggestion	4.03	Very	5
6.	Leaflets	3.91	Very	6
7.	TV Advertisement	3.89	Very	7
8.	Wall paintings	3.39	Moderately	8
9.	Exhibiton	2.99	Moderately	9
10.	Jeep campaign	2.57	Slightly	10

Conclusion

In the study area, Market potential of Imivax, Battalion FS, Delma, Wuxal was found 29.9 Lakh, 23.2 Lakh, 53.1 Lakh, 1.12 Cr respectively and the total market potential of all these four products is 2.18 Cr. Farmers face the following problems in groundnut cultivation: cost of input, insect attack, uneven/low germination, rust & tikka disease, wilting, yellowing, low quality seed, labour, seed rot, and mechanisation. Farmer influences for purchase of any product from demonstrations, retailer suggestion, farmers' meeting. Aside from that, farmers rely on retailer recommendations when purchasing a product; therefore, it is crucial to establish strong working relationships with retailers in order to increase company sales, yield the highest possible profit and improve market position.

Application of research: This research is helpful for organization to know the product potential related to crop and current market players and their market share. Organization can also identify their product preference from the farmer or consumer. Organization can redesign the strategy to increase their market share.

Research Category: Agribusiness Management

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