# Market Potential of Selected Agricultural Products and Problems Identification of Groundnut Cultivation in Bhankhokhari Market of Devbhoomi Dwarka District


## ABSTRACT

This study was conducted from 1st of June to 31st of July 2022. sample of 125 farmers selected on convenience from 5 villages of Khambhaliya taluka of Devbhoomi Dwarka districts of Gujarat. Primary data were collected with the help of semi-structured schedules, and appropriate tools were used to analyse data. Market potential of CARBOXIN 37.5% + THIRAM 37.5% WS, THIAMETHOXAM 30% FS, AZOXYSTROBIN 8.3% + MANCOZEB 66.7% WG and NPK 11:11:8 FORTIFIED ZINC & BORON product is around 25.25 lakh, 19.64 lakh, 74.82 lakh and 94.70 lakh respectively. The major problems faced by farmers in groundnut crop are high cost of inputs, insect attacks, wilting, and rust & tikka disease. In the study it is observed that farmer that does not use seed treatment in their field faces a problem of wilting and uneven/less germination and farmers that do not use micronutrient products in the crop faces a problem of yellowing. The most effective tools responsible for purchase decision of a product are retailers' suggestion, farmers' meetings, and demonstration of the product.



**Keywords:** Groundnut, Fungicide, Insecticide, Market Potential




## 1. INTRODUCTION

India is the fourth largest producer of agrochemicals globally, after the United States, Japan and China. The agrochemicals industry is a significant industry for the Indian economy. The global agrochemicals market size reached US$ 266.7 Billion in 2021. And projected to reach US$ 339.4 Billion by 2027 with a growth rate (CAGR) of 4.01 percent during 2022-2027. India's agrochemical consumption is one of the lowest in the world with per hectare consumption of just 0.58 Kg compared to the US (4.5 Kg/ha) and Japan (11 Kg/ha). In India, paddy accounts for the maximum share of pesticide consumption, around 28 percent, followed by cotton (20 percent). The Indian pesticides market reached a value of around INR 212 Billion in 2021. And projected to reach INR 320 Billion by 2027 with a CAGR of 7.07 percent during 2022-2027. (Agrochemicals Market Report by IMARC, 2021)

Groundnut is popularly known as the peanut and it is a leguminous crop. The oil content in the seed is estimated to be around 44-50 percent. Mainly cultivated variety of groundnut in Gujarat is GG20, GG22, GG32, TG39, TG37, and GG34. The seeds are sown at a depth of 5-6 cm in the soil at the rate of 50 Kg seed per acre. The major diseases found in groundnut crops are rust, early and late leaf spots, collar rot, aflatoxins and peanut bud and stem necrosis. The major insect pests that infest the groundnut crops are white grub, tobacco caterpillar, gram pod borer, red hairy caterpillar, etc. The average yield of Groundnut is 1500-2000 Kg/ha.

Patel and Lad (2019) find the total market potential of Narkis product for paddy crop in Anand. Jalu et al. (2022) identify different constraints like high price of improved seeds, Pest and disease infestation, high wages of labour and lack of knowledge about critical stages. Chaudhary (2018) find different promotional tools like Distributor, Pesticide company officials, mass media, fellow farmers, Government extension agencies, farmer meeting, demonstration, jeep campaign, posters and leaflets, TV advertisements.

**Objectives of the study**

- To study socio-economic profile of farmers

- To study market potential of selected agricultural products in groundnut
- To identify problems faced by farmers during cultivation of groundnut
- To study effective promotional tools for scaling up the use of company products

## 2. MATERIAL AND METHODS

The Present study was carried out during 1st of June to 31st of July 2022. Primary data were collected from the respondents with the help of semi-structured schedule. Secondary data were collected from Department of agriculture Devbhoomi Dwarka District and Private and Government publications and websites. The study was study is descriptive in nature. Tabular analysis, weighted average mean, cross tabulation and Garrett ranking method are used for analysis. This study was carried out in selected villages (Bhankhokhari, Tathiya, Fot, Kotadiya, Laliya) of Khambhaliya taluka with a sample size of 125 respondents. All the respondents were groundnut growing farmers. For the selection of the samples, Non-probability sampling method is used and samples were drowned by Convenience and Purposive sampling. The data was collected with the help of a semi-structured schedule.

**Analytical Tools**

The market potential of selected agricultural products was calculated by the following formula.

Market Potential = Total area covered under groundnut crop* Doses Required* Price of the product

$Mp = A(acre) \times D(per\ acre) \times P(Rs.)$

Where,

A = Total area under groundnut

P = Price of Product (Rs/kg)

D = Dose/acre (kg/acre)

To find out the most serious problem in groundnut cultivation Garrett's ranking technique was used. As per this method, the farmers were asked to assign the rank for all factors and the outcome of such ranking was converted into score value with the help of the following formula:

Percent position = $100\ (Rij - 0.5)/ Nj$

Where, Rij = Rank given for the ith variable by jth respondents

Nj = Number of variable ranked by jth respondents

With the help of Garrett's Table, the percent position estimated was converted into scores. Then for each factor, the scores of each individual were added and then total value of scores and mean values of score was calculated. The problem having highest mean value was considered to be the most serious problem.

**LIMITATIONS OF THE STUDY**

The scope of study is limited to the respondents from selected villages of Khambhaliya taluka. The research is carried out for the period of 60 days only. The sample unit was only 125 respondents. The analysis was purely based on the responses of the farmers, and therefore a bias may exist. Information is collected for only selected agricultural products used in groundnut.

## 3. RESULTS AND DISCUSSION

**Table 1 Profile of Respondents**

| Sr. No. | Particulars | Respondents | Percent |
|---|---|---|---|
| 1 | **Age** | | |
| | Below 2 | 11 | 8.80 |
| | 25-40 | 75 | 60.00 |
| | 40-55 | 39 | 31.20 |
| | **Total** | 125 | 100.00 |
| 2 | **Educational Status** | | |
| | Illiterate | 14 | 11.20 |
| | Primary (up to VIII) | 68 | 54.40 |
| | Secondary (IV to XII) | 35 | 28.00 |
| | Graduate | 8 | 6.40 |
| | **Total** | 125 | 100.00 |
| 3 | **Land holding** | | |
| | < 1 ha. | 7 | 5.60 |
| | 1 to 4 ha. | 42 | 33.60 |
| | 4 to 8 ha. | 58 | 46.40 |
| | > 8 ha. | 18 | 14.40 |
| | **Total** | 125 | 100.00 |
| 4 | **Source of Irrigation** | | |
| | Well | 70 | 56.00 |
| | Tube well | 53 | 42.40 |
| | Pond/ Check dam | 2 | 1.60 |
| | **Total** | 125 | 100.00 |
| 5 | **Cropping Pattern** | | |
| | Groundnut - Chickpea | 25 | 20.00 |
| | Groundnut - Chickpea - Fodder crop | 15 | 12.00 |
| | Groundnut - Cumin | 30 | 24.00 |
| | Groundnut - Cumin - Fodder crop | 18 | 14.40 |
| | Groundnut - Coriander | 18 | 14.40 |
| | Groundnut - Coriander - Fodder crop | 4 | 3.20 |
| | Groundnut - Wheat | 15 | 12.00 |
| | **Total** | 125 | 100.00 |

In the study area, the majority of the farmers (60 percent) belonged to 25-40 age group, followed by 40-55 age group (31.20 percent). More than 50 percent of farmers attained primary level of education so the chances to adopt new things regarding agriculture is more because the young respondents are early adopters to adopt new technology.

The total land holding capacity of the farmers is a crucial factor on which the consumption of agriculture inputs and the risk-taking ability will depend. The majority of farmers (46 percent) were having land between 4 to 8 hectares, followed by 1 to 4 hectares of land holding (33.60 percent).

The source of irrigation is a crucial factor on which the production of crops is dependent. In the study it is found that in kharif crop most of the farmers are depended on rains for irrigation some farmers have water facilities were gone for early sowing. Around 56 percent farmers have Well as a source of irrigation.

Different location has their different cropping pattern as per the availability of water and soil type. Main crops grown in the study area were Groundnut, Wheat, Chickpea, Cumin, Coriander and Fodder crops like Maize and Sorghum. In kharif season all respondents grow groundnut. In rabi season 38.40 percent farmers grow cumin, 32 percent farmers grow chickpea, 17.60 percent farmers

grow coriander and 12 percent farmers grow wheat. In summer season 29.60 percent farmers grow fodder crops and the remaining farmers do not sow anything in their fields.

**Table 2 Market Potential of Selected Agricultural Products**

Market potential of selected agricultural products was calculated for groundnut crop. Table 2 present the estimated market potential of selected agricultural products. Total potential area for the

| Product | Dose | Area (in Acre) | Price | Market Potential | Market Potential (Rs.) |
|---|---|---|---|---|---|
| CARBOXIN 37.5% + THIRAM 37.5% WS | 3 gm/kg | 9353 | 1800/Kg | 1403 Kg | 25.25 lakh |
| THIAMETHOXAM 30% FS | 3 ml/kg | 9353 | 1400/L | 1403 L | 19.64 lakh |
| AZOXYSTROBIN 8.3% + MANCOZEB 66.7% WG | 0.6 kg/acre | 9353 | 800/0.6 Kg | 5612 Kg | 74.82 lakh |
| NPK 11:11:8 FORTIFIED ZINC & BORON | 750 ml/acre | 9353 | 1350/L | 7015 L | 94.70 lakh |

products was around 9353 acres (District Agriculture Officer, Devbhoomi Dwarka). For CARBOXIN 37.5% + THIRAM 37.5% WS product dose is 3 grams per kg. of seed, seed rate is 50 kgs per acre so market potential is around 25.25 Lakhs. For the THIAMETHOXAM 30% FS product dose of application is 3 ml per kg of seed and seed rate is 50 kgs per acre so market potential is around 19.64 Lakhs. For AZOXYSTROBIN 8.3% + MANCOZEB 66.7% WG product dose is 800 gm per acre so the market potential is around 74.82 Lakhs. For NPK 11:11:8 FORTIFIED ZINC & BORON product dose is 750 ml gm per acre so the market potential is around 94.70 Lakhs.

**Table 3 Problems Faced by Farmers in Groundnut Crop**

| Factors no. | Factors | Garrett total score | Mean Score | Rank |
|---|---|---|---|---|
| F1 | High Cost of inputs | 9014 | 72.11 | 1 |
| F2 | Insect Attack | 8051 | 64.41 | 2 |
| F3 | Wilting | 7204 | 57.63 | 3 |
| F4 | Rust & Tikka Disease | 7093 | 56.74 | 4 |
| F5 | Uneven/Less germination | 6403 | 51.22 | 5 |
| F6 | Seed rot | 6036 | 48.29 | 6 |
| F7 | Labour Availability | 5558 | 44.46 | 7 |
| F8 | Yellowing | 4619 | 36.95 | 8 |
| F9 | Low quality seed | 4523 | 36.18 | 9 |
| F10 | Mechanization | 3689 | 29.51 | 10 |

By analysing common problems faced by farmers in groundnut crop, it is found that cost of input (Seed, Fertilizer, Pesticides, Growth regulators) was reported to be the most serious problem faced by farmers at an overall level with a Garrett score of **9014 (**Table 3), Second is Insects attacks that cause damage to the groundnut crop.

The study used cross-tabulation to find the relation between different variables and it is found that farmer that does not use seed treatment in their field faces a problem of wilting and uneven/less germination (Table 4 & 5) and farmers that do not use micronutrient products in the crop faces a problem of yellowing (Table 6). Cross-tabulation of landholding pattern with uses of seed treatment and micronutrient products shows that farmers having more landholding uses seed treatment and micronutrient-based solutions (Table 7 & 8).

❖ **Table 4 Do you use seed treatment? * Give the Rank to the Problems Faced during crop establishment in groundnut [Wilting] Crosstabulation**

Count

| | | Give the Rank to the Problems Faced during crop establishment in groundnut [Wilting] | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | |
| Do you use seed treatment? | Yes | 2 | 7 | 11 | 21 | 44 | 9 | 3 | 2 | 2 | 3 | 104 |
| | No | 8 | 4 | 3 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 21 |
| Total | | 10 | 11 | 14 | 23 | 45 | 10 | 3 | 4 | 2 | 3 | 125 |

❖ **Table 5 Do you use seed treatment? * Give the Rank to the Problems Faced during crop establishment in groundnut [uneven/less germination] Crosstabulation**

Count

| | | Give the Rank to the Problems Faced during crop establishment in groundnut [uneven/less germination] | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | |
| Do you use seed treatment? | Yes | 0 | 4 | 10 | 15 | 41 | 13 | 10 | 4 | 3 | 5 | 104 |
| | No | 9 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 21 |
| Total | | 7 | 9 | 7 | 13 | 17 | 42 | 14 | 11 | 5 | 3 | 125 |

❖ **Table 6 Do you used any Micronutrient based solution? * Give the Rank to the Problems Faced during crop establishment in groundnut [Yellowing] Crosstabulation**

Count

| | | Give the Rank to the Problems Faced during crop establishment in groundnut [Yellowing] | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | |
| Do you used any Micronutrient based solution? | Yes | 2 | 3 | 1 | 2 | 4 | 2 | 2 | 27 | 21 | 5 | 69 |
| | No | 16 | 22 | 1 | 5 | 2 | 1 | 1 | 1 | 0 | 7 | 56 |
| Total | | 4 | 18 | 25 | 2 | 7 | 6 | 3 | 3 | 28 | 21 | 125 |

❖ **Table 7 Land Holding * Do you use seed treatment? Crosstabulation**

Count

| | | Do you use seed treatment? | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Land Holding | <1 ha | 3 | 8 | 7 |
| | 1-4 ha | 33 | 9 | 42 |
| | 4-8 ha | 50 | 4 | 58 |
| | >8 ha | 18 | 0 | 18 |
| Total | | 104 | 21 | 125 |

❖ **Table 8 Land Holding * Do you used any Micronutrient based solution? Crosstabulation**

Count

| | | Do you used any Micronutrient based solution? | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Land Holding | <1ha | 1 | 6 | 7 |
| | 1-4 ha | 16 | 26 | 42 |
| | 4-8 ha | 38 | 20 | 58 |
| | >8 ha | 13 | 5 | 18 |
| Total | | 69 | 56 | 125 |

To increase the selling of any products, company will do promotional activities or marketing activities, so that people will know about the products and thus ultimately the selling of products is increase because of promotional activities or marketing activity will create or increase awareness

among people about products. Above table show that Farmers' meeting, Retailers' suggestion, Demonstration, and Farmers/friends' suggestion these four activities were extremely influence the respondents at the time of purchasing the pesticide product. And Jeep campaign, TV advertisement and Exhibition were very influence the respondents at the time of purchasing the product. And Leaflets, Posters, wall paintings these three activities were moderately influence the respondents at the time of purchasing the pesticide product (Table 9).

❖ **Table 9 Promotional Tools/Activities responsible for Purchase decision**

| Tools/Activities | Mean Score | Result | Rank |
|---|---|---|---|
| Farmer meeting | 4.84 | Extremely | 1 |
| Retailers' suggestion | 4.82 | Extremely | 2 |
| Demonstration | 4.79 | Extremely | 3 |
| Farmers / friends suggestion | 4.67 | Extremely | 4 |
| Jeep campaign | 3.83 | Very | 5 |
| TV Advertisement | 3.71 | Very | 6 |
| Exhibition | 3.45 | Very | 7 |
| Posters | 3.39 | Moderately | 8 |
| Leaflets | 3.34 | Moderately | 9 |
| Wall painting | 3.18 | Moderately | 10 |



## 4. Conclusion

Around sixty percent of respondents were age between twenty-five to forty years, fifty-four percent of respondents were having Primary Education, forty-six percent of farmers having four to eight hectares of landholding and forty-four percent of farmers have an annual income between five to ten lakhs. In study area market potential of CARBOXIN 37.5% + THIRAM 37.5% WS, THIAMETHOXAM 30% FS, AZOXYSTROBIN 8.3% + MANCOZEB 66.7% WG and NPK 11:11:8 FORTIFIED ZINC & BORON product is around 25.25 lakh, 19.64 lakh, 74.82 lakh and 94.70 lakh respectively. The major problems faced by farmers in groundnut crop are High cost of inputs, insect attacks, wilting, and rust & tikka disease. Most effective tools responsible for Purchase decision of product are retailers' suggestion, farmers' meetings, and demonstration of the product.

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## COMPETING INTERESTS

"Authors have declared that no competing interests exist.".

## AUTHORS' CONTRIBUTIONS

All authors worked together to complete the project. The main author of this work is Ujas Bhikadiya. He designed this study with author Yogeshkumar Lad. Survey and analysis were conducted by authors Ujas Bhikadiya and Vishita Khanna. The manuscript's first draught was written by author Ujas Bhikadiya. The final manuscript was created after author Yogeshkumar Lad had reviewed the draught. The final manuscript was reviewed and approved by all writers.

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