



# Problem Identification of Groundnut Cultivation in Bhadthar Market of Devbhoomi Dwarka District, India

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## Authors' contributions

*This work was carried out in collaboration among all authors. The main author of this work is author DZ. He designed this study with author SM. Survey and analysis were conducted by authors DZ, SG and MB. The manuscript's first draught was written by author DZ. The results and discussions were made with the cooperation of author VN. The final manuscript was created after author SM had reviewed the draught. The literature searches were conducted by the author VV. All authors read and approved the final manuscript.*

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## ABSTRACT

The study was aimed on "Problem Identification of Groundnut Cultivation in Bhadthar Market of Devbhoomi Dwarka District". The study type was descriptive research. Since groundnut was the most important crop farmed in the area during the Kharif season, the study was primarily focused on groundnut. The research was carried out in Bhadthar, Bhinda, Movan, Golan Sherdi, and Thakar Sherdi villages of Khambaliya Taluka in Gujarat's Devbhoomi Dwarka District. The primary data were collected from 150 respondents from the previously mentioned villages. To meet the study's objectives, both primary and secondary data were collected. The primary survey was carried out with the help of a Semi-structured Schedule. Groundnut farmers' major problems were the high

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input cost followed by diseases like rust and tikka disease, wilting, seed rot, and yellowing. The retailer's suggestion was the highest influencing factor followed by a farmer's/friend's suggestion, demonstration, farmer meeting, exhibition, leaflets, TV advertisement, poster, wall paintings and jeep campaigns, which influence the farmer's purchase decision of pesticides followed by the farmer/friend's suggestion and demonstration.

**Keywords:** Fungicide; insecticide; groundnut; plant diseases; oil seed crop.

## 1. INTRODUCTION

One of India's prominent oil seed crops is the ground nut (*Arachis hypogea* L.), which accounts for around 36% of the global oil seed production. The primary challenges that growers encountered in the kharif groundnut season were the scarcity of labour and other inputs during peak times, the high cost of essential inputs, the low price at which they could be produced, and a lack of technical understanding [1]. Severe seedling mortality caused by soil- and seed-borne illnesses leads to a scattered crop stand, especially in sandy loam soils, and diminishes yield by 25 to 50% [2]. The most prominent oilseed crop in India is groundnut, which considerably adds to the nation's vegetable shortage. Oilseeds are mostly grown in rainfed conditions throughout 26.4 million hectares with an overall output of 37.1 million MT [3]. Oil concentration ranges from 44-50% depending on agro-climatic conditions. It has a good amount of protein content (22–30%), vitamins (E, K, and B complex), minerals including phosphorus, potassium, magnesium, and calcium, as well as certain phytosterols, making it an edible oil [4]. The seeds of groundnut can be crushed to produce groundnut meal as a byproduct and oil (animal feed). Quality groundnut oil is utilized in cooking because of its high smoke point (440°F), neutral flavour, and odour [5-8]. Pesticides have played a significant role in the progress of agricultural production in India and all over the world [9]. Pesticide utilization in India is stated to account for less than 2% of world demand and is limited to one-fourth of the entire arable land area, or approximately 180 million hectares (Kumar, 2020). Despite significant growth drivers, the Indian agrochemical sector faces many challenges, including low awareness and knowledge, non - scientific consumption with increasing consumption of nongenuine products (nearly 25% by volume), decreased levels of study and development, as well as price factors, which are restricting potential growth [10]. Meanwhile, India's pesticide usage is among the lowest in the world, with a per hectare usage of 0.60 Kg/ha, as opposed to 2.5 Kg/ha in the

United States, 13 Kg/ha in China, as well as an average rate of 3 Kg/ha [11].

### 1.1 Global Scenario of Groundnut

China was the highest groundnut producing country in the world in 2022 with 18,300 MT production followed by India (6,650 MT), Nigeria (4,500 MT), and United States (2,618 MT) (usda.gov, 2022).

### 1.2 Indian Scenario of Groundnut

Approximately 90% of the acreage and production of groundnut are grown in key states like Gujarat, Andhra Pradesh, Tamil Nadu, Rajasthan, and Maharashtra. The highest groundnut-producing state was Gujarat in 2019-20 with 4,645.52 tonnes followed by Rajasthan (1,619 Tonnes), Tamil Nadu (1,033 Tonnes), and Andhra Pradesh (848.79 Tonnes) (Apeda, 2020). The higher costs of cultivation for kharif groundnuts were land rental, hired labour costs, seed costs, bullock labour costs, and family labour.

### 1.3 Objectives of the Study

- To identify problems faced by groundnut farmers
- To study promotional tools influencing farmers' purchase decision

## 2. MATERIALS AND METHODS

The study was carried out during June 1<sup>st</sup>, 2022 to July 31<sup>st</sup>, 2022.

- i. **Sampling unit:** Farmer;
- ii. **Sample size:** 150;
- iii. **Sampling method:** Non-probability sampling;
- iv. **Sampling technique:** Convenience sampling;
- v. **Research Instrument:** Semi-structured Schedule;
- vi. **Area of survey:** Selected villages of Khambhaliya taluka (Bhadthar, Bhinda, Movan, Thakar sherdi and Golan sherdi)

## 2.1 Analytical Tools

- The Garrett ranking method was used to identify the problems faced by the groundnut farmers. This method was introduced by Henry Edward Garrett in 1969 [12].
- According to the procedure, respondents were asked to rank each of the problems, and the results of this ranking were then transformed into a score value using the formula below:

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

Where;

R<sub>ij</sub> = Rank given for the ith variable by jth respondents

N<sub>j</sub> = Number of variables ranked by jth respondents

- The weighted average mean was used to study promotional tools influencing the farmer's purchase decision.

## 3. RESULTS AND DISCUSSION

### 3.1 Socio-economic Profile of Farmers

The most crucial demographic factor is the respondents' age range. The study revealed that 4% of respondents were under the age of 25, 35% were between the ages of 25 and 40, 54% were between the ages of 40 and 55, and 7% were higher than or equal to 55. Therefore, as 89% of respondents in the Bhadthar market are between the ages of 25 and 55, there are more opportunities for new agricultural practices to be adopted as those in the younger age group are early adopters of new technologies. The respondent's level of education is a crucial factor. According to the survey, 5% of respondents are illiterate, 12% have completed education up to the primary level, 49% have completed secondary education, 30% have completed higher secondary education, while 4% have completed a graduate degree or above. That means chances of adoption of new technology become easy in the study area due to the higher literacy rate of respondents. The amount of land

that farmers may own in total is a key determinant of the consumption of agricultural inputs and their capacity for taking risks. In the survey, it was discovered that 11% of respondents have land that is smaller than 1 ha, 37% of respondents have land that is between 1 and 4 ha, 45% of respondents have land that is between 4 and 8 ha, and 7% have land that is larger than 8 ha. Therefore, most of the farmers are situated as far as land is concerned in the range of 4-8 ha, so consumption of agricultural inputs may be high in the study area. The primary determinant of whether a farmer will buy any input is its income. Out of 150 respondents, 18% of respondents had incomes below one Lakh, 33% of respondents had incomes between one and five Lakh, 45% of respondents had incomes between five and ten Lakh, and 4% had incomes surpassing ten Lakh. Most of the farmers had higher income, so they had higher purchasing power. That can become helpful to the company to sell their pesticides in the study area. Here, the study revealed that the farmer's primary source of income was agriculture. Seventy-two percent of the 150 respondents had agricultural work as their main source of income, while the remaining 28 percent of respondents had both agriculture and livestock work as their source of income. The most vital factor for agricultural output is irrigation. 68% of respondents were dependent on wells for irrigation, while 32% depended on tube wells.

### 3.2 Cropping Pattern of Farmers

In the study area, it was found that out of the total agricultural land owned by the respondents around 1573 acres of land were occupied by the groundnut crop for the Kharif Season 2022. In the Kharif season, the respondents were mostly farming groundnut crop. Cotton was also a major crop cultivated in the study area. Cumin (47.33%), chickpea (32%), and coriander (20.66%) were the crops planted for Rabi. In the summer, only a few individuals plant crops, such as fodder sorghum or fodder maize (34%), while the remaining 66% do not grow any crops.

**Table 1. Cropping Pattern of the Respondents in Rabi Season**

Cropping Pattern [Rabi]	No. of Respondent	Percentage
Cumin	71	47.33%
Chickpea	48	32%
Coriander	31	20.66%

**Table 2. Cropping Pattern of the Respondents in the Summer Season**

Cropping Pattern [Summer]	No. of Respondent	Percentage
Fodder Sorghum/Maize	51	34%
Fallow Land	99	66%

**Table 3. Problem Faced by Farmers in Groundnut Crop**

Problems	Garrett score	Mean Score	Rank
High cost of input	9644	64.29	1
Disease	8523	56.82	2
Insects attack	8166	54.44	3
Uneven/less germination	8015	53.43	4
Labour availability	7215	48.10	5
Mechanization	5312	35.41	6
Low-quality seed	4753	31.68	7

**Table 4. Disease Severity in the Study Area**

Disease	Mean Score	Rank
Wilting	63.08	1
Rust and Tikka disease	54.08	2
Seed rot	53.29	3
Yellowing	39.97	4

The Table 3 shows the various problems faced by groundnut farmers. These problems include high input costs, insect attacks, uneven/low germination, labour availability, mechanization, and low-quality seed. Among these issues, farmers are most concerned about the expense of inputs, followed by disease.

By analyzing common diseases faced by farmers in the groundnut crop, wilting was highly faced by farmers followed by rust and tikka disease, seed rot, and yellowing.

### 3.3 Pesticides Information from Farmers

Seed treatment is crucial in safeguarding seedlings and seeds from seed and soil-borne illnesses and insect infestation that affect crop emergence and growth [13,14]. The study revealed that 93% of respondents apply seed treatment, while the other 7% do not. Respondents employed seed treatment due to its numerous benefits, such as improved seed germination, insect and disease prevention, and increased yield. 9% of respondents were using Imivax, 15% of respondents were using Gaucho, 11% of respondents were using Vitavax, 4% of

respondents were using Indofil M-45, 16% of respondents were using Nilaayan, and 5% of respondents were not aware of the products which they were using in groundnut. Most of the farmers were using Indofil M-45 because it gives quite a good result. The fungicide was used by farmers to control the fungal diseases in groundnut crop. Among the 150 farmers, 14 farmers were using Cabrio Top, 3 farmers were using Delma, 21 farmers were using Custodia, 20 farmers were using Prospell, 11 farmers were using Shan, 27 farmers were using Turf, 30 farmers were using Contaf Plus and the rest of 24 farmers were unaware about the fungicide, which they were using. Contaf Plus was famous among respondents due to better results at lower prices. The micronutrient product was used by farmers to boost the growth of the groundnut by fulfilling their nutrient requirements. Among the 150 respondents, 99 respondents were using the micronutrient solution in their groundnut crop. Just 51 respondents were not using any micronutrients. Out of 150 farmers, just 5 were using Wuxal, 15 were using Macarena, 9 were using Allwin Top Plus and 11 were using Fantac Plus micronutrient solution. Most of the farmers were unaware about the micronutrient products which they were using in groundnut.

**Table 5. Promotional Factors that Influence Respondents the Most at the Time of Purchasing the Product**

Factors	Mean Score	Rank
Retailer's suggestion	4.92	1
Farmer/Friend suggestion	4.88	2
Demonstration	4.38	3
Farmer meeting	4.04	4
Exhibition	3.78	5
Leaflets	3.37	6
TV advertisement	3.34	7
Poster	3.16	8
Wall paintings	2.53	9
Jeep campaign	2.52	10

The above data shows that the retailer's suggestion, a farmer's/ friend's suggestion and demonstration were highly affecting factors on the farmer's purchase decision.

#### 4. CONCLUSION

The majority of the farmers belong to the age group of 40-55 years old, and most of the farmers have education up to SSC, so the chances to adopt new technology regarding agriculture are high in the study area. Therefore, the chances of acquiring new customers are high in the study area. In the Kharif season, farmers grow only groundnut, so the company can sell more pesticides during the respective season. The results show that the biggest problems faced by farmers were the high cost of input in groundnut cultivation followed by disease, insect attack, and uneven or less germination. Thus, the loss was increased due to a higher infestation of diseases and insects in the study area. The study also revealed that the retailer's suggestion, farmer's/ friend's suggestion, as well as demonstration are highly influential tools, so they can be used by the company to influence farmers to purchase pesticides.

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#### COMPETING INTERESTS

Authors have declared that they have no known competing financial interests or non-financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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