An economic analysis of production of groundnut in Haryana

NISHA KASHYAP*, NEERAJ PAWAR, DP MALIK and SUMIT

Department of Agricultural Economics, CCS Haryana Agricultural University
Hisar 125004 Haryana, India
*Email for correspondence: nisha805356@gmail.com

 Received: 12.12.2023/Accepted: 16.01.2024

ABSTRACT

The current study investigates the costs, returns and constraints associated with groundnut production, focusing on the districts of Fatehabad, Hisar, Sirsa and Rewari in Haryana. The primary data for the study were gathered during the year 2021-22 through a survey conducted via personal interviews using a well-structured interview schedule. The calculated average total cost of cultivating groundnut across the four districts was Rs 98,275 per ha. Among these districts, Rewari stood out with the highest total cost of Rs 106,886 per hectare followed by Sirsa (Rs 100,271/ha), Fatehabad (Rs 93,790/ha) and Hisar (Rs 92,155/ha). Considering gross returns, which incorporated the value of byproducts, Rewari district again emerged as the leader with Rs 169,376 per hectare. In contrast, the other districts demonstrated lower gross returns per ha viz Sirsa (Rs 145,692), Fatehabad (Rs 129,242) and Hisar (Rs 128,781). The overall average net return per hectare was Rs 44,997. As B-C ratios were greater than one, this indicated that groundnut cultivation was economically viable in all the districts, with Rewari district having the highest profitability. Additionally, the study identified critical constraints impeding groundnut production. These constraints encompassed limited availability of improved seed varieties, high seed costs, increased instances of pest and disease infestations and the challenges of unpredictable weather and climatic conditions. These constraints collectively posed significant challenges to groundnut farmers, impacting both their productivity and profitability.

Keywords: Groundnut; production; economic analysis; cost; profitability; constraints

INTRODUCTION

Oilseed crops hold a significant position in the agricultural sector, ranking second only to cereals within the category of field crops. Presently, India, while being the world's largest oilseed producing nation, also ranks among the top importers of vegetable oils. In light of the evolving food supply scenario, oilseeds are anticipated to play an increasingly crucial role.

The diverse agro-ecological conditions across India provide a favourable environment for the cultivation of nine annual oilseed crops, which include seven edible varieties (such as groundnut, rapeseed and mustard, soybean, sunflower, sesame, safflower and niger) and two non-edible types (castor and linseed) (Hegde 2012). Of the nine oilseed crops, three crops, viz groundnut, rapeseed-mustard and soybean, contribute 86.42 per cent in area and 90.95 per cent in production of total oilseeds. The non-edible oilseeds constitute only 4.67 per cent of the total area and 5.53 per cent of the total production of all oilseeds, implying the role played by the edible oilseed cultivation of India (Joseph and Karunakaran 2022). Andhra Pradesh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal contribute more than 95 per cent of total oilseed production in the country (Singh 2021).

Groundnut (*Arachis hypogeal* Linn) is a vital oilseed and food crop. Native to South America, it holds a central role in India's oilseed economy, offering not only edible vegetable oil but also a valuable source of protein and essential nutrients. Groundnut kernels contain 47-53 per cent oil and 25-36 per cent protein (Banla et al 2018, Taru et al 2008). Groundnuts find extensive application in various forms, from cooking oil to snacks and even contribute to industries such as soap and cosmetics. The byproducts derived from groundnut harvesting and oil extraction, including peanut

meal, skin, hull and vines, have multiple applications, ranging from fodder to antioxidant-rich compounds.

Groundnut plants need well drained sandy loam or clay loam soil for better performance. The soil should be deep and the pH of the soil should be around 5.5 to 7 with high fertility index. Residual soil fertility is essential while cultivating groundnuts. This is obtained by growing non-leguminous crops prior to groundnuts and fertilizing them properly with potassium and phosphorus content. The soil is tested and then required amount of fertilizers are added, but the general recommendations for groundnut crops are FYM 10 to 12 tonnes per hectare. The plants may need micronutrients like nitrogen 8-20 kg, phosphorus 16-80 kg and potassium 1-75 kg per ha. Calcium 200-400 kg per ha helps in good seed development in groundnut plants. Other than these the crop may need micronutrients like boron 3-4 kg per ha, zinc 10-20 kg per ha and sulphur and iron (Anon 2019).

In India, it was cultivated on 6.01 million hectares of land with production of 10.24 million tonnes in 2020-21 (Anon 2023). Gujarat, Tamil Nadu, Andhra Pradesh, Rajasthan, Karnataka, Madhya Pradesh and Maharashtra are the leading producers of groundnut, contributing significantly to both area and production. Among the states, Gujarat stood first in area coverage with 2.16 million ha followed by Andhra Pradesh (0.87 million ha), Rajasthan (0.86 million ha), Karnataka (0.72 million ha) and Tamil Nadu (0.41 million ha). Also, production-wise Gujarat stood first with 4.13 million tonnes followed by Rajasthan (1.93 million tonnes), Tamil Nadu (1.02 million tonnes) and Andhra Pradesh (0.78 million tonnes) during 2020-21 (Anon 2023).

In the state of Haryana, groundnut cultivation takes place primarily in Fatehabad, Sirsa, Hisar, Bhiwani and Jhajjar. Despite fluctuations in acreage, the yield has witnessed an upward trend, with Fatehabad being a prominent contributor to both area and production. This paper explores the dynamics of groundnut cultivation in Haryana, its nutritional significance, agricultural practices applied in cultivation and regional contributions, shedding light on its role in the nation's oilseed economy.

METHODOLOGY

The present study was based on the collection of primary data during 2021-22. Four districts namely, Fatehabad, Hisar, Sirsa and Rewari were purposively selected on higher area under groundnut basis. From each selected district, one or two villages were selected randomly on the basis of availability of groundnut growers. Finally, twenty one farmers were selected from each selected district. A total of 84 farmers were selected from all seven villages in the four districts. Each selected farmer was personally interviewed with the help of a pre-tested and well-defined schedule which included the detailed information about cropping pattern, the cost incurred, per hectare yield and returns from groundnut cultivation and the factors influencing groundnut. The tools and techniques employed in the analysis of collected data were subjected to tabular analysis, estimation of per hectare cost and returns of cultivation and benefit-cost ratio analysis. The descriptive analysis techniques were used to examine the opinions of sampled farmers and processors related to various constraints and factors influencing groundnut cultivation. The various statistical tools, like average, percentage, benefit-cost ratio (B-C ratio), total weighted score, weighted mean score and rank order etc were employed to draw valid inferences from the study. Benefit-cost ratio, total weighted score and least severe constraint were calculated as under:

$$\text{Benefit-cost ratio} = \text{Gross return/Total cost}$$

$$\text{Total weighted score} = \Sigma(\text{Number of responses} \times \text{Corresponding score})$$

$$\text{Weighted mean score} = \frac{\text{Total weighted score}}{\text{Total number of respondents}}$$

where Severe constraint = Score 3, Moderate constraint = Score 2, Least severe constraint = Score 1

RESULTS and DISCUSSION

Cost and return of groundnut cultivation

The total cost borne by the farmers in Rewari district was the highest (Rs 106,886/ha) followed by Sirsa (Rs 100,271/ha), Fatehabad (Rs 93,790/ha) and Hisar (Rs 92,155/ha) (Table 1). This disparity in cost might be attributed to the intensive utilization of all inputs in the Rewari district. The total cost encompassed variable, fixed, and marketing costs.

Variable cost constituted the major proportion of the total cost across all the districts, except for Fatehabad, where variable cost was marginally lower than fixed cost. This discrepancy could be primarily

due to the substantial share of rental value of land which accounted for 37.85 per cent of the total cost, which was the highest among the components. Breaking down the variable cost, harvesting and threshing charges accounted for a significant portion, particularly in Rewari district (15.58%), surpassing Fatehabad (13.14%), Sirsa (12.79%) and Hisar (12.75%). This divergence could be attributed to the greater reliance on manual labour for these activities in Rewari.

Another notable factor was the cost of seed and seed treatment, which was significantly higher in Rewari (13.03%) compared to the other districts. This difference might have stemmed up from the use of more expensive bold-seeded varieties in Rewari, requiring larger quantities in comparison to the small-seeded varieties utilized in other districts. Within fixed cost, the rental value of land emerged as a major component across all districts due to the escalating land values in recent years. Rewari district exhibited a relatively lower proportion (33.63%) of the rental value of land compared to Fatehabad (37.85%), Hisar (37.44%) and Sirsa (37.26%), likely due to the limited availability of irrigation resources in Rewari.

Moreover, management charges and risk factors, calculated based on variable cost, were notably higher in Rewari district (10.51%) compared to Sirsa (9.93%), Fatehabad (9.89%) and Hisar (9.92%). This discrepancy could be due to the higher total variable cost in the Rewari district compared to the other districts.

The average groundnut yield stood at 24.61 quintals per hectare. Remarkably, Rewari district showcased the highest yield, reaching 29.15 quintals per hectare, surpassing Sirsa (25.17 q/ha), Fatehabad (22.30 q/ha) and Hisar (21.83 q/ha). This divergence in yield could be attributed to the sandy loam soil type prevalent in Rewari, which proved to be more suitable for groundnut cultivation.

When incorporating the value of byproducts, the gross return per hectare emerged the highest in Rewari district (Rs 169,376) as opposed to Sirsa (Rs 145,692), Fatehabad (Rs 129,242) and Hisar (Rs 128,781). This disparity in gross return can be largely attributed to the slightly higher output per hectare in the Rewari district in comparison to the other districts. On an overall level, the gross return averaged Rs 143,273 per hectare.

The average net return for groundnut cultivation was Rs 44,997 per hectare. However, the net return per hectare exhibited variation across the districts, with Rewari leading in net return (Rs 62,491) followed by Sirsa (Rs 45,421), Hisar (Rs 36,625) and Fatehabad (Rs 35,453). This observed pattern of increasing net return with higher production can be attributed to the economies of scale, particularly evident in the Rewari district.

The yield advantage of Rewari district highlights the benefits farmers would reap from adopting improved groundnut varieties, which could potentially replace local ones. This is indicative of the potential for enhancing farmer incomes simply through variety selection.

Ngulube et al (2001) reported lower bound of likely returns to Malawi farmers investing in groundnut production. There were quite substantial returns to groundnut production at all input levels. The benefit-cost ratio of greater than one at all input levels simply suggested that it was worthwhile investing in groundnut production. Since 6 5 per cent of Malawi's population was poor, cultivation of improved groundnut varieties could, therefore, play an important role in alleviating poverty in the smallholder sector.

The benefit-cost (B-C) ratio based on total cost was found to be highest in Rewari district (1.79) followed by Sirsa (1.50), Hisar (1.46) and Fatehabad (1.43). The differences in B-C ratio among the various districts were relatively marginal. However, the overall benefit-cost ratio stood at 1.55, indicating that groundnut cultivation was financially viable. Kurrey and Jain (2018) reported that the input-output ratio in case of groundnut was 1:2.07 at marginal farms to 1:2.42 at large farms in Raigarh district of Chhattisgarh state.

Constraints faced by groundnut growers: The various constraints faced by the groundnut growers in the selected districts are shown in Table 2. The most prevalent constraint highlighted by majority of respondents was the inadequate availability of improved seed varieties coupled with high seed cost. Respondents expressed that this was primarily due to the unavailability of improved and high-yielding varieties through state agencies. They often had to resort to use varieties from other states, that were not well-suited to their local conditions, resulting in sub-optimal performance. This observation is consistent with the

Table 1. Cost and return of groundnut cultivation in selected districts of Haryana

Component	District				Overall
	Fatehabad	Hisar	Sirsa	Rewari	
Cost structure					
Variable cost (Rs)					
Field preparation and sowing	8,001	7,831	8,419	7,510	7,941
	(8.53)	(8.50)	(8.40)	(7.03)	(8.08)
Seed and seed treatment	8,261	8,662	9,898	13,927	10,187
	(8.81)	(9.40)	(9.87)	(13.03)	(10.37)
Fertilizer investment	6,542	6,700	6,999	6,272	6,628
	(6.97)	(7.27)	(6.98)	95.87)	(6.74)
Irrigation	3,632	3,322	3,671	3,646	3,568
	(3.87)	(3.60)	(3.66)	(3.41)	(3.63)
Plant protection	5,762	5,660	6,040	6,031	5,873
	(6.14)	(6.14)	(6.02)	(5.64)	(5.98)
Harvesting and threshing	12,320	11,750	12,824	16,651	13,386
	(13.14)	(12.75)	(12.79)	(15.58)	(13.62)
Interest and miscellaneous	1,848	1,796	1,924	2,150	1,929
	(1.97)	(1.95)	(1.92)	(2.01)	(1.96)
Total variable cost	46,367	45,721	49,776	56,187	49,513
	(49.44)	(49.61)	(49.64)	(52.57)	(50.38)
Fixed cost (Rs)					
Transportation charges	1,895	1,850	2,089	2,626	2,115
	(2.02)	(2.01)	(2.08)	(2.46)	(2.15)
Rental value of land	35,500	34,500	37,361	35,949	35,827
	(37.85)	(37.44)	(37.26)	(33.63)	(36.46)
Management charges and risk factor	9,273	9,144	9,955	11,237	9,902
	(9.89)	(9.92)	(9.93)	(10.51)	(10.08)
Total fixed cost	**46,668**	**45,494**	**49,405**	**49,812**	**47,845**
	(49.76)	**(49.37)**	**(49.27)**	**(46.60)**	**(48.68)**
Marketing cost (Rs)					
Loading and weighing charges	754	940	1,090	887	918
	(0.80)	(1.02)	(1.09)	(0.83)	(0.93)
Total marketing cost	**754**	**940**	**1,090**	**887**	**918**
	(0.80)	**(1.02)**	**(1.09)**	**(0.83)**	**(0.93)**
Total cost	**93,790**	**92,155**	**100,271**	**106,886**	**98,275**
	(100.00)	**(100.00)**	**(100.00)**	**(100.00)**	**(100.00)**
Return structure					
Main	122,159	120,250	137,691	158,610	134,677
	(22.30)*	(21.83)*	(25.17)*	(29.15)*	(24.61)*
By-product	7,084	8,531	8,002	10,766	8,596
Gross return	**129,242**	**128,781**	**145,692**	**169,376**	**143,273**
Return over variable cost	82,875	83,059	95,916	113,190	93,760
Net return	35,453	36,625	45,421	62,491	44,997
B:C (variable cost)	2.85	2.88	2.99	3.68	3.10
B:C (total cost)	1.43	1.46	1.50	1.79	1.55

Note: Values in parentheses indicate percentages of total cost; *Values in parentheses indicate yield in quintals

findings of Laxman (2020). Furthermore, respondents identified the high incidence of pest and disease infections as another critical challenge impacting their ability to achieve higher return. The constraints identified by the respondents highlight the intricate challenges faced by groundnut farmers, spanning from seed availability and quality to pest and disease management and the unpredictable impact of weather conditions. The studies done by Laxman (2020) and Dinesh (2011), further validate the significance of these constraints.

CONCLUSION

The study revealed that groundnut cultivation in the examined districts was proven to be a profitable

Table 2. Constraints faced by growers in groundnut cultivation

Constraint	Level of constraint			Total weighted score	Weighted mean score	Rank
	Severe (3)	Moderate (2)	Least severe (1)			
Less availability of improved variety/seed	70	10	4	234	2.79	I
High cost of seed	65	16	3	230	2.74	II
High incidence of pest and disease infection	51	23	10	209	2.49	III
Uncertain weather/climate	40	40	4	204	2.43	IV
Non-adoption of package of practices/low inputs used	43	27	14	197	2.35	V
Scarcity of labour during peak season	44	29	11	201	2.39	VI
Lack of processing units (distance from nearest processing unit)	34	25	25	177	2.11	VII

venture. Among these districts, Rewari stood out with consistently superior in input utilization, cost and return. While there were slight variations, Fatehabad, Hisar and Sirsa districts demonstrated similar levels of input use, cost and return. The favourable B-C ratio exceeding one, underscored the economic viability of groundnut cultivation across all districts with Rewari leading in terms of profitability. However, the study highlighted critical challenges faced by groundnut farmers which included limited access to improved seeds, high susceptibility to pests and diseases and unpredictable weather patterns. Addressing these constraints is pivotal for enhancing the productivity and profitability of groundnut farming in these regions.

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