Archives of Current Research International

Volume 25, Issue 7, Page 300-306, 2025; Article no.ACRI.139168
ISSN: 2454-7077

An Economic Analysis of Chia Cultivation in Kalyan Karnataka Region

Shiva Kumar [a++*], Jainuddin S M [b#], Amrutha T Joshi [a†], Vasudeva Naik [c#] and A S Police Patil [d‡]

[a] Department of Agricultural Economics, University of Agricultural Sciences, Raichur, Karnataka-584104, India.
[b] Department of Agricultural Economics, College of Agriculture, Kalaburgi, University of Agricultural Sciences, Raichur, Karnataka-584104, India.
[c] Department of Agricultural Economics, College of Agriculture, Gangavati, University of Agricultural Sciences, Raichur, Karnataka-584104, India.
[d] AICRP on Pigeonpea ZARS, Kalaburagi, University of Agricultural Sciences, Raichur, Karnataka-584104, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: https://doi.org/10.9734/acri/2025/v25i71334

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://pr.sdiarticle5.com/review-history/139168

Original Research Article

Received: 01/05/2025
Accepted: 01/07/2025
Published: 05/07/2025

[++]M.Sc. Scholar;
[#]Assistant Professor;
[†]Professor & Head;
[‡]Scientist (Agronomy);
**Corresponding author: Email: shivunaiks18@gmail.com;*

Cite as: *Kumar, Shiva, Jainuddin S M, Amrutha T Joshi, Vasudeva Naik, and A S Police Patil. 2025. "An Economic Analysis of Chia Cultivation in Kalyan Karnataka Region". Archives of Current Research International 25 (7):300-306. https://doi.org/10.9734/acri/2025/v25i71334.*

ABSTRACT

Chia (*Salvia hispanica* L.) is gaining prominence as a superfood and medicinal plant within the Lamiaceae family, celebrated for its pseudocereal status and nutritional benefits worldwide. Introduced to India by the Central Food Technological Research Institute (CFTRI) in Mysuru, it has swiftly spread across the country, including Karnataka's Kalyan-Karnataka region, owing to its rich nutritional profile and medicinal properties. This study delved into the cost and returns structure of chia cultivation, focusing on Bidar and Kalaburagi districts, which are pivotal due to their significant chia cultivation areas. Primary data was gathered through surveys of 30 sample farmers from each district during the 2023-24 period, totalling 60 samples. The findings revealed that chia cultivation in Bidar was marginally more profitable compared to Kalaburagi, evident from higher net returns. However, the returns per rupee invested were superior in Kalaburagi. The net returns over total costs stood at Rs 22652.50 and Rs 23755.40 per acre in Bidar and Kalaburagi respectively, with benefit-cost ratios of 2.46 and 2.61. Productivity per acre slightly favoured Bidar at 3.11 quintals compared to Kalaburagi 3.08 quintals, due to better water management practices and proper adoption of technology by the farmer. Overall, chia cultivation in these districts showcases promising economic viability and productivity, highlighting its potential as a lucrative crop for farmers in the region.

Keywords: CFTRI; returns per rupee expenditure; net returns; Karnataka.

1. INTRODUCTION

Chia (*Salvia hispanica* L.) is an emerging super food and medicinal plant belonging to Lamiaceae family and the centre of origin is in mountain areas of Guatemala and Mexico (Ixtaina et al., 2008). Chia is mainly cultivated in countries like Argentina, Australia, Bolivia, Colombia, Guatemala, Mexico and Peru. Chia has repeatedly cultivated in South-east Asia and Caribbean (Jansen et al., 1991; Grimes et al., 2018). Chia is a new crop to India and it was introduced by Central Food Technological Research Institute (CFTRI) in Mysuru district and initially grown by farmers in few areas in Mysuru (Song et al., 2017).

According to the Nutritional Science Research Institute (NSRI), chia seed is considered a Dietetic Nutritional Supplement by the Food and Drug Administration in the United States and qualified as “healthy food” by NSRI’s standards. Chia (*Salvia hispanica* L) has a long history as a food crop, both for humans and animals and is being “rediscovered”. Nowadays it is treated as a newly discovered superfood (Baginsky et al., 2016; Hassani et al., 2022).

Presently chia cultivation has spread across Karnataka and including Kalyan Karnataka region (Bochicchio et al., 2015). It is emerging and newly introduced crop in Kalyan-Karnataka region and largely cultivated in Bidar and Kalaburagi districts especially during rabi season. In Bidar, the chia crop is majorly grown in Bhalki, Humanabad and Bidar talukas, where as in Kalaburagi, majorly found in Chitapur and Chincholi talukas (Bordin-Rodrigues et al., 2021). The average yield of chia in Karnataka is 3 quintals per acre for white variety and about 4 quintals per acre for black variety. The average yield of chia is 3-4 quintals/acre but under appropriate agronomic conditions, the yield may reach to 8-9 quintals/hectare. Successful cultivation of chia crop in India will improve economic condition and living standards of farmers (Police Patil et al., 2020). The objective of the study was to estimate the economics of chia farming.

2. METHODOLOGY

2.1 Source of Data

To achieve the specific objectives of the study, primary data was collected from farmers using a pre-structured and thoroughly tested interview schedule through the personal interview method conducted in the study area. The data collected was utilized to estimate the cost and returns associated with chia seed cultivation. For sample selection, two districts Bidar and Kalaburgi were chosen based on the area under chia cultivation. From each district, two talukas were selected using the same criterion. In each selected taluka, 15 farmers were identified using the snowball sampling technique, resulting in a total sample size of 30 farmers per district.

2.2 Analytical Tools and Techniques Employed

To fulfill the specific objectives of the study, the collected data were analyzed using tabular analysis to estimate the cost and returns of chia seed cultivation.

2.3 Estimation of Cost and Returns

The cost and returns of chia crop was estimated by using tabular analysis. The costs were classified into variable and fixed costs. Variable cost includes the cost of inputs viz., seed(kg), fertilizer (kg), FYM (Farm Yard Manure), plant protection chemicals (₹), human labour (man days), bullock labour (pair days), machine labour (Hrs) and interest on working capital (₹). Fixed cost includes depreciation on farm implements (₹), the rental value of land (₹) and interest on fixed farm implements (₹).

It was observed at the time of data collection that farmers of these regions were more familiar with acre as the unit of measuring of the land area instead of a hectare. Hence, in this study, all calculations pertaining to the cost and returns of chia production were calculated on per acre basis (2.47106 acres = 1 hectare).

3. RESULTS AND DISCUSSION

3.1 Cost and Returns of Chia Cultivation in Study Area

The study of costs and returns of chia cultivation helps the farmers to maximize profit by adopting efficient resource management practices. The total costs are discussed under two categories *viz.*, variable costs and fixed costs on per acre basis. Variable costs include expenses on labor utilized for performing farm operations and expenditure on material inputs viz., seeds, manures, fertilizers and plant protection chemicals. The fixed costs are depreciation on assets, interest on fixed cost, rental value of owned land and land revenue. The different items of costs as percentage of their respective totals provide the relative importance of each cost. Hence, costs and their proportionate share are presented in Table 1.

The total cost incurred in study area was ₹ 15063.50, of which 9320.22 (61.87%) was variable cost and 5740.00 (38.12%) was fixed cost. It could be seen from the Table 1 that among the total cost, rental value on land formed the major component with 32.67 per cent followed by labor cost (37.10%), chemical fertilizers (13.34%), depreciation (4.90%), manure (4.35%), interest on working capital (4.38%), seeds (2.46 %) and land revenue (0.54%). The results are in line with Makadia et al., (2012) that studied the cost structure of minor millets grown in tribal Dang district of Gujarat.

The findings of the study indicated that, chia was cultivated with traditional practices which are labour intensive. However, the availability of labour especially during harvesting season was inadequate as perceived by chia growing farmers during the survey of chia farmers carried out. Therefore, in order to reduce the cost of cultivation, it is necessary to develop the labour saving practices such as use of machineries and also appropriate demonstration methods may be adopted to educate the farmers on optimum use of inputs. Further, there is need to strengthen the extension service to educate the farmers on soil fertility and importance of recommended dose of fertilizers. It was also observed that chia was grown on marginal lands and farmers mostly go for manual harvesting in the study area.

In case of Bidar district, per acre total cost of cultivation of chia was ₹ 15445.16, of which 10023.75 (64.89%) was variable cost and 5421.40 (35.10%) was fixed cost. Among the total cost, rental value of land formed the major component with 32.67 per cent followed by labour cost (39.79%), chemical fertilizer (13.15%), depreciation (4.51%), FYM (4.65%), interest on working capital (4.80%), seeds (2.42%) and land revenue (0.50%). Similar pattern was noticed in Kalaburagi district with total cost of ₹ 14682.60 constituting variable cost (₹ 8616.69) and fixed cost (₹ 6065.91). The distributions of variable and fixed costs were similar to that of Bidar district. The study results indicated that the total cost of cultivation of chia in Bidar (₹ 15445.16) district was higher than compared to total cost of chia cultivation in Kalaburagi (₹ 14682.60) district. footnotes. Table headings should be placed above the table. Footnotes should be placed below the table with superscript lowercase letters. Sample table format is given below.

The overall average yield of chia in the study area was 3.09 quintals per acre and sale price of chia was ₹ 12365 per quintal. So, the gross returns obtained by chia cultivators was amounted to ₹ 38267.75 per acre with net returns of 23203.95 in the study area.

Table 1. Cost and returns of chia cultivation in study area (₹ /acre)

Sl. No.	Particulars	Bidar		Kalaburgi		Overall	
		Total	%	Total	%	Total	%
I	Variable cost						
1	Material input cost						
a	Seed(₹/Kg)	375.00	2.42	367.13	2.50	371.06	2.46
b	FYM (₹)	718.75	4.65	594.40	4.04	656.57	4.35
c	Chemical fertilizer (₹)	2031.25	13.15	1989.51	13.55	2010.00	13.34
2	Labour cost						
a	Human labour (MD)	2968.75	19.22	2307.69	15.71	2637.50	17.50
b	Bullock labour (MD)	2187.50	14.10	1880.51	12.80	2033.50	13.49
c	Machine labour(₹/Hr)	1000.00	6.47	839.16	5.17	919.50	6.10
3	Interest on working capital@8%	742.50	4.80	638.27	4.34	690.38	4.38
4	Total Variable Cost	10023.75	64.89	8616.69	58.68	9320.22	61.87
II	Fixed cost						
a	Land revenue	77.54	0.50	86.75	0.59	82.14	0.54
b	Depreciation	698.02	4.51	781.003	5.31	739.50	4.90
c	Rental value of land	4645.84	30.07	5198.15	35.40	4921.50	32.67
5	Total fixed cost	5421.40	35.10	6065.91	41.31	5743.00	38.12
III	Total cost cultivation(₹)	15445.16	100.00	14682.60	100.00	15063.50	100.00
IV	Returns						
a	Yield(q)	3.11	-	3.08	-	3.09	-
b	Price of product(₹/q)	12250	-	12480	-	12365	-
c	Gross return(₹)	38097.50	-	38438.30	-	38267.75	-
	Net return(₹)	22652.50	-	23755.40	-	23203.95	-
	Returns per rupee expenditure	2.46	-	2.61	-	2.53	-

(Source: Field survey)

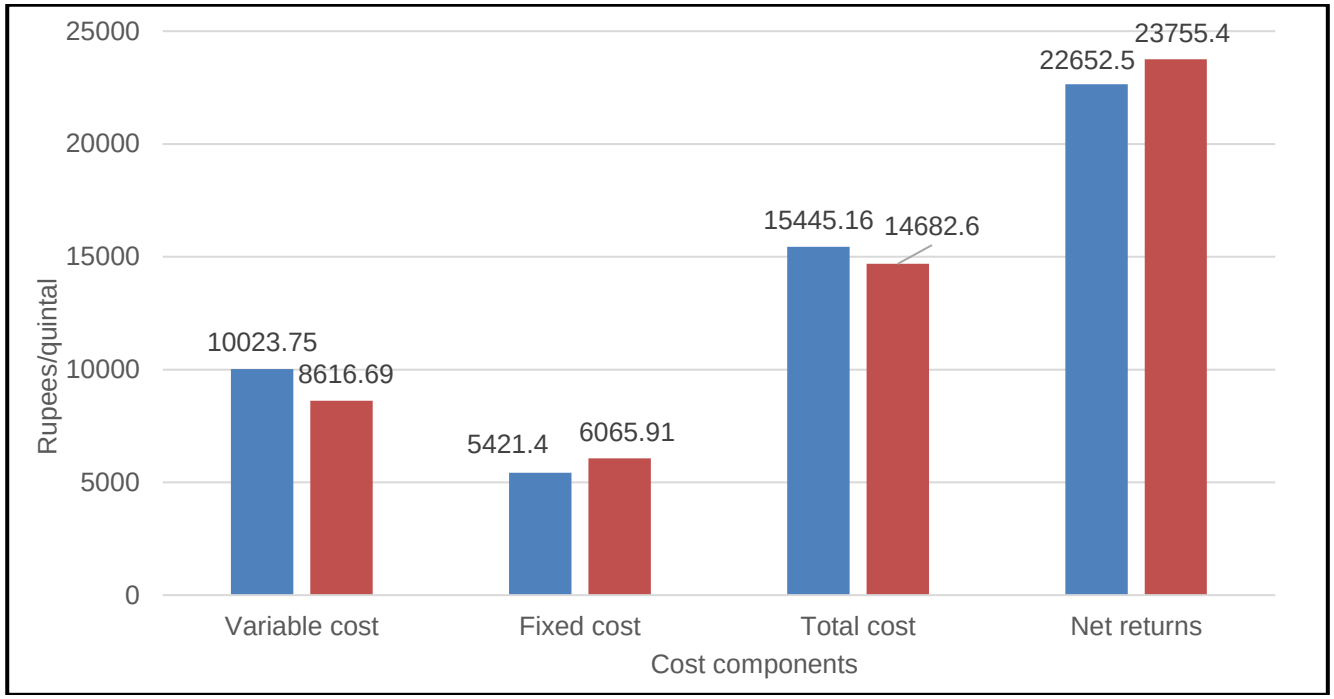

Fig. 1. Cost of cultivation of chia farmers in the study

Further, the benefit cost ratio was 2.53 in study area. The average yield in Bidar (3.11 qtls/acre) district was marginally higher than compared to Kalaburagi (3.08 qtls/acre) district. The sale price realized by chia growers in Bidar (₹ 12250.00/q) was relatively lower than Kalaburagi (₹ 12480.00) which might be due to better marketing facilities in the Kalaburagi. But, the gross returns obtained by chia cultivators in Kalaburagi (₹ 38438.30/acre) was relatively higher than Bidar (₹ 38097.50/acre) district that might be due to higher productivity of chia crop and better crop management practices followed in the study area. The, benefit cost ratio was 2.46 and 2.61 in Bidar and Kalaburagi district respectively. The results were in contrast with the Jaiswal and Hugar (2011) study on sorghum cultivation.

4. CONCLUSION

The study depicted that average yield obtained from an acre of chia cultivation was low in the study area due to most of the farmers were used to farm produced seeds for sowing and adopted traditional production technologies. So, the study would like to suggest to develop high yielding varieties coupled with improved production technologies, their widespread adoption and good support price. Additionally, developing robust marketing infrastructure in regions like Bidar can ensure fair pricing for farmers and improve their overall profitability. Marginal lands should be utilized efficiently by providing targeted guidance on sustainable chia cultivation. Seeds, and machinery along with access to low interest credit can further support small and marginal farmers in adopting these practices effectively.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

CONSENT

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

Baginsky, C., Arenas, J., Escobar, H., Garrido, M., Valero, N., Tello, D., ... & Silva, H. (2016). Growth and yield of chia (Salvia hispanica L.) in the Mediterranean and desert climates of Chile. *Chilean Journal of Agricultural Research, 76*(3), 255–264.

Bochicchio, R., Philips, T. D., Lovelli, S., Labella, R., Galgano, F., Di Marisco, A., ... & Amato, M. (2015). Innovative crop productions for healthy food: The case of chia (Salvia hispanica L.). In *The sustainability of agro-food and natural resource systems in the Mediterranean basin* (pp. 29–45).

Bordin-Rodrigues, J. C., da Silva, T. R. B., Soares, D. F. D. M., Stracieri, J., Ducheski, R. L. P., & da Silva, G. D. (2021). Bean and chia development in accordance with fertilization management. *Heliyon, 7*(6). https://doi.org/10.1016/j.heliyon.2021.e07047

Grimes, S. J., Phillips, T. D., Hahn, V., Capezzone, F., & Graeff-Hönninger, S. (2018). Growth, yield performance and quality parameters of three early flowering chia (Salvia hispanica L.) genotypes cultivated in Southwestern Germany. *Agriculture, 8*(10), 154. https://doi.org/10.3390/agriculture8100154

Hassani, M., Piechota, T., & Atamian, H. S. (2022). Prediction of cultivation areas for the commercial and an early flowering wild accession of Salvia hispanica L. in the United States. *Agronomy, 12*(7), 1651. https://doi.org/10.3390/agronomy12071651

Ixtaina, V. Y., Nolasco, S. M., & Tomás, M. C. (2008). Physical properties of chia (Salvia hispanica L.) seeds. Industrial crops and products, 28(3), 286-293.

Jaiswal, A., & Hugar, L. B. (2011). An economic analysis of sorghum cultivation vis-à-vis its competing crops in Madhya Pradesh. *Karnataka Journal of Agricultural Sciences, 24*, 591–592.

Janse, P., Lemmens, R., Oyen, L., Siemonsma, J., Stavast, F., & Vanvalkenburg, J. (1991). Plant resources of South-East Asia: Basic list of species and commodity grouping. *Pudoc, Wageningen, Netherlands*, 59, 171–178.

Makadia, J. J., Patel, K. S., & Ahir, N. J. (2012). Cost structure of minor millets grown in tribal Dang district of South Gujarat. *International Research Journal of Agricultural Economics and Statistics, 3*, 40–44.

Police Patil, A. S., Ambrish, G., Reddy, S. B., & Redd, B. S. (2020). Importance of chia (Salvia hispanica) cultivation in Indian agriculture. *Vigyan Varta, 1*(6), 17–19.

Song, R., Yan, B., Zhou, J., Zhu, X., Xu, J., & Yi, Z. (2017). Introduction and cultivation of Salvia hispanica L. (Chia) and its value of health care. *Agricultural Science & Technology, 18*(12), 2263–2285.

Peer-review history:
The peer review history for this paper can be accessed here:
https://pr.sdiarticle5.com/review-history/139168