



RESEARCH ARTICLE

Ginger cultivation in the Shivalik foothills: An economic assessment of production and constraints

Ankush¹, Gurnam Singh¹, Janailin S Papang^{1*}, Vikas Sagwal² & Asmit Saini³

¹Department of Agricultural Economics, Chaudhary Charan Singh Haryana Agricultural University, Hisar 125 001, Haryana, India

²Department of Vegetable Science, Maharana Pratap Horticultural University, Karnal 132 001, Haryana, India

³Department of Vegetable Science, Chaudhary Charan Singh Haryana Agricultural University, Hisar 125 001, Haryana, India

*Correspondence email - janai4ndri@gmail.com

Received: 14 January 2026; Accepted: 18 May 2026; Available online: Version 1.0: 30 August 2026

Cite this article: Ankush, Gurnam S, Janailin SP, Vikas S, Asmit S. Ginger cultivation in the Shivalik foothills: An economic assessment of production and constraints. Plant Science Today. 2026;13(sp5):01–06. <https://doi.org/10.14719/pst.13678>

Abstract

Production of ginger (*Zingiber officinale* Roscoe) in Haryana is concentrated in the Shivalik foothills of Panchkula district. Thus, Pinjore and Morni Blocks of Panchkula district were selected to conduct the present study. A multistage sampling method was used to collect primary data from 80 farmers during the 2023 kharif crop season. Costs and returns, as well as resource use efficiency, were estimated. The net returns from ginger cultivation were found to be around ₹44017.65/ha with a B: C ratio of 1.31 over variable costs and 1.05 over total costs. The total cost amounted to ₹804357.45/ha, with major expenses incurred on the cost of seed rhizome (44.19 % of the total cost). Resource use efficiency analysis indicated that inputs such as fertiliser and farmyard manure (FYM), plant protection and human labour were under-utilised, while rhizome seed cost was over-utilised. The study also found that ginger cultivation experienced a decreasing return to scale (0.77). The non-availability of quality seed rhizome at nearby markets leads to a high cost of planting material, which constitutes the major constraint faced by farmers. Other constraints include inadequate irrigation facilities, low remunerative prices and lack of awareness about market information. The study suggests government initiatives to create awareness about the available subsidy on horticultural crops and promote the use of small farm machinery. Fortified extension networks as well as market linkage would help in elevating the income of farmers to enrich the potential of ginger production in the Shivalik foothills.

Keywords: ginger; production economics; resource use efficiency; Shivalik foothills

Introduction

India is often referred to as the "spice bowl of the world" due to its diverse and high-quality spice production. The cultivation of spices for various purposes dates back to ancient times, with mentions in the Vedas as early as 6000 BC. India's prominence in the spice trade has been significant since the exploration of sea routes, attracting foreign interest and playing a key role in its history of invasions and colonisation by European powers (1). According to the Bureau of Indian Standards (BIS), India grows 63 different spices, with cultivation spanning from tropical to temperate climates, giving the country the highest variety of spices globally.

Ginger (*Zingiber officinale* Roscoe) is an important commercial spice crop. It is an ancient medicinal plant belonging to the family Zingiberaceae, which also includes turmeric (*Curcuma longa* L.) and cardamom (*Elettaria cardamomum* (L.) Maton). It is indigenous to Southeast Asia and transported throughout the Indo-Pacific during the Austronesian expansion. Ginger, as a high-value spice crop, has the potential to enhance the socioeconomic status of rural communities by increasing their income (2). India is the largest producer of ginger and accounts for 45 % of the world's ginger production, followed by Nigeria, China and Nepal (3). The area under cultivation in India is about 63000 ha with a total production of about 2 million tonnes (Mt). India is the

largest consumer of ginger and holds the 7th position in ginger export worldwide. In India, Karnataka, Madhya Pradesh, Assam and Odisha are the major ginger-producing states (4). It can be used to enhance the flavour of a variety of foods such as vegetables, candies, sodas, pickles and beverages. Ginger has many medicinal properties, like anti-ulcer, antioxidant, anti-inflammatory, enhances blood circulation and along with this, it also regulates cholesterol level (5). The dried ginger or ginger powder is generally used in the manufacturing of ginger brandy, wine and beer in many Western countries. Ginger oil is primarily used as a flavouring agent in confectionery and for soft drinks.

Given ginger's versatile applications in food flavouring and its valuable medicinal and industrial properties, regions with suitable agro-climatic conditions hold significant potential for its commercial cultivation. The Shivalik foothills region is situated in Northwestern India, nestled between the Himalayan ecosystem to the north and the Indo-Gangetic plains to the south. The Shivalik foothills cover the states of Haryana, Punjab, Himachal Pradesh, Jammu and Kashmir and Uttarakhand with an area of 3.09 million hectares (Mha) (6). Haryana has a huge potential for the marketing of ginger due to its close proximity to metropolitan cities. Even though ginger has such potential, most farmers are reluctant to engage in commercial ginger farming. To attract farmers toward

ginger farming, first thing that needs to be ensured is its profitability. To ensure higher profitability and contribution of ginger in improving the livelihood of farmers, efficient cost structure and appropriate level of input utilisation must be understood and recommended (7).

Materials and Methods

The present study was conducted in the state of Haryana, India. In the first stage of sampling, Panchkula district was purposively selected as it accounted for about 96 % of the total area and production of ginger in Haryana during 2024–25 and the district had 46 ha area under ginger cultivation, of which data were collected from 10.3 ha, representing 22.4 % of the total area. At the second stage of sampling, Pinjore and Morni blocks were chosen based on having the highest area under ginger cultivation within Panchkula district (Fig. 1). At the third stage of sampling, different numbers of villages were chosen randomly from each selected block to ensure a representative sample for the study. In the 4th stage of sampling, 40 ginger growers from each selected block were randomly chosen. In total, 80 ginger growers were selected through a multistage random sampling procedure from the selected district and interviewed using a pre-tested schedule.

Economic analysis of ginger production

The cost and returns of ginger cultivation were analysed for the crop year 2023 (kharif). The costs and returns of the ginger crop were estimated using descriptive statistical measures, primarily averages and percentages. These parameters included: farm inputs cost, total variable cost, fixed cost and net returns from the production and marketing of ginger.

Resource use efficiency of ginger cultivation

For estimating resource use efficiency, the Cobb-Douglas production function was employed due to its logarithmic linearity, facilitating ordinary least squares regression and its provision of input elasticities that directly quantify marginal productivity and returns to scale, assuming constant returns and substitutability.

The Cobb-Douglas production function is a well-documented model, with its relative merits extensively discussed (8).

To examine the resource productivity and the efficiency of farmers in the use of resources, all relevant explanatory variables, namely, seed (X_1), fertiliser and farmyard manure (FYM) (X_2), plant protection (X_3) and human labour (X_4) in value terms were included in the analysis.

The format of the production function is as follows:

$$Y = aX_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} \mu \quad (\text{Eq. 1})$$

where, a = Intercept, Y = Gross return (₹/ha), X_1 = Seed (₹/ha), X_2 = Fertiliser and FYM (₹/ha), X_3 = Plant protection (₹/ha), X_4 = Human labour (₹/ha)

m = Random term

$b = b_1, b_2, \dots, b_4$ are elasticities of production

To estimate the parameters, the method of least squares was employed and the goodness of fit was evaluated by computing the coefficient of determination (9). Both dependent and explanatory variables were transformed using the natural logarithm. The equation mentioned above (Eq. 1) was converted to a linear form for ease of computation. The efficiency of resource utilisation in ginger production was determined by calculating the ratio of marginal value product (MVP) to marginal factor cost (MFC) of variable inputs, based on the estimated regression coefficients obtained from the Cobb-Douglas production function. This efficiency measure was computed using the following formula:

$$r = \frac{\text{MVP}}{\text{MFC}} \quad (\text{Eq. 2})$$

where,

r = Efficiency ratio

MVP = Marginal value product of a variable input, which is the value of an incremental unit of output resulting from the additional unit of input.



Fig. 1. Map of Panchkula district and selected blocks.

MFC = Marginal factor cost (Price per unit input), which is equal to one since both dependent and explanatory variables are converted to monetary value. So, increasing input by 1 unit means increasing expenditure by ₹1.

The value of MVP was estimated using the regression coefficient of each input and the price of the output.

$$MVP = (b_i) \frac{P}{\bar{x}_i} \quad (\text{Eq. 3})$$

where,

B_i = Estimated regression coefficient of input X

$\bar{Y}$ = Geometric mean value of output

$\bar{x}_i$ = Geometric mean value of the input being considered

The decision rule for the efficiency analysis was as:

$r = 1$ (Efficient use of a resource)

$r > 1$ (Underutilisation of a resource)

$r < 1$ (Overutilisation of a resource)

Finally, the relative percentage change in MVP can be calculated using following formula:

$$D = \left[1 - \frac{1}{r} \right] 100 \quad (\text{Eq. 4})$$

where D = absolute value of percentage change in MVP of each resource (10).

Results and Discussion

Cost and returns of ginger cultivation

In the Pinjore and Morni blocks, ginger is grown as a rain-fed crop. It is either grown as a sole crop or intercropped with chilli or turmeric. This study focused solely on ginger as a sole crop, predominantly cultivated on terraces and upland areas. The sowing of ginger in the study area begins only after the first monsoon rain, which occurs in the first fortnight of July. Most

farmers use local varieties such as Himgiri and Giriganga for seed rhizomes. Harvesting of ginger typically occurs after 150–165 days post-sowing and it was conducted manually by labour in the study area. After the cleaning and sorting process, the entire ginger harvest was buried in the soil for the remaining winter season. Subsequently, they were retrieved during the warm days at the end of February or in the month of March. The ginger rhizomes are then cut into small pieces and dried in the sunlight. Once dried, the ginger is ready for sale as dry ginger (*Gadda saunth*).

Socio-economic characteristics of sample farmers

Ginger stands as one of the key spice crops cultivated and utilised in India. However, in Haryana, its production holds the 24th position nationwide. Nestled in the Shivalik foothills of Panchkula, ginger farmers predominantly comprise middle-aged farmers aged 30–50, equipped with secondary education and living in resilient nuclear family units, as vividly illustrated in Table 1. They bring medium farming experience (10–30 years) to marginal land holdings (< 2.5 acres), cultivating ginger on small plots (0.1–0.5 acres), ideal for the region's terraced topography and high-value spice production.

Cost structure in ginger cultivation

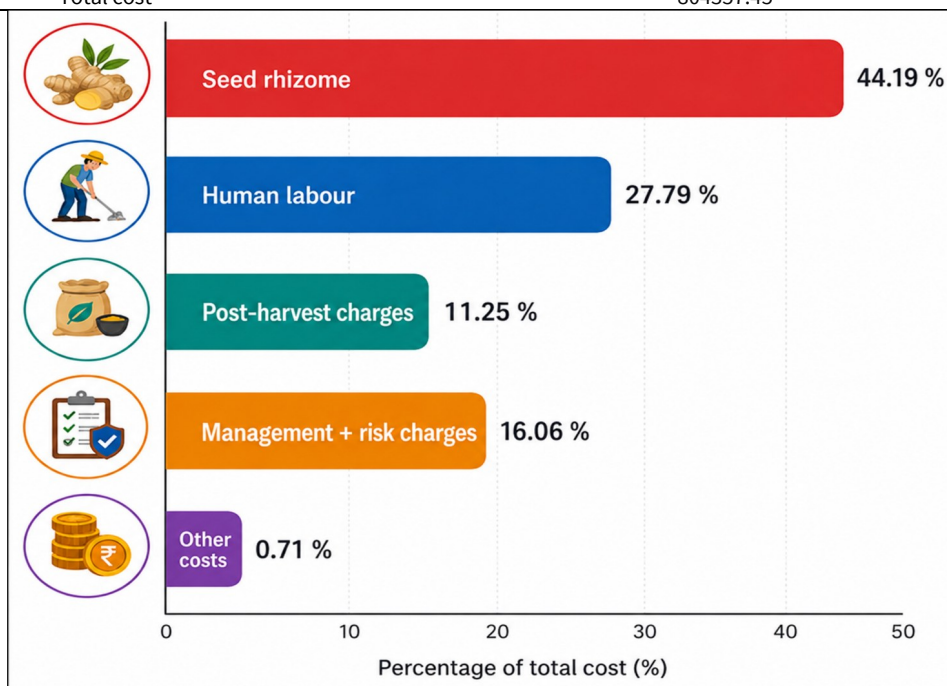
The total cost of cultivating ginger in Panchkula district of Haryana was ₹804357.45/ha, with a total variable cost of ₹645781.02/ha, accounting for 80.28 % of the total cost in the study area as strikingly depicted in Fig. 2. Within variable costs seed rhizome amounted to ₹355453.35/ha, the highest among variable costs, representing 44.19 % of the total cost followed by labour cost which is ₹223524.96/ha, making up 27.79 % of the total cost (Table 2). Similar to the findings of this research, it is also reported that the cost of seed is the main contributor to the cost of ginger farming (with a share of 42 % and 32.5 %), followed by labour cost (11, 12). The costs incurred on post-harvest, harvesting, weeding, sowing, FYM and fertilisers were 11.25, 7.20, 4.48, 4.06 and 1.33 % of the total cost respectively. The share of the fixed cost in total cost was 19.72 % in which highest share held by management charges (8.03 %) and risk factor (8.03 %) followed by rental value of land (3.66 %).

Table 1. Socio-economic characteristics of sample farmers in Panchkula district of Haryana

Variable	Panchkula		
	Category	Frequency	Percentage (%)
Age (Years)	Young (< 30)	12	15
	Middle (30–50)	40	50
	Old (> 50)	28	35
	Total	80	100
Education	Illiterate	4	5
	Primary level	16	20
	Secondary level	44	55
	Graduate and above	16	20
	Total	80	100
Family type	Nuclear	60	75
	Joint	20	25
	Total	80	100
Experience in farming (Years)	Less (< 10)	12	15
	Medium (10–30)	40	50
	High (> 30)	28	35
	Total	80	100
Size of farm (Acres)	Marginal (< 2.5)	60	75
	Small (2.51–5)	16	20
	Medium (5.1–10)	4	5
	Large (> 10)	0	0
	Total	80	100
Area under ginger crop (Acres)	0.1–0.5	68	85
	0.51–1	12	15
	> 1	0	0
	Total	80	100

Table 2. Cost structure in ginger cultivation in Panchkula district of Haryana (2023)

Sl. No.	Particulars	Quantity	Value in ₹/ha	Percentage (%)
1	Preparatory tillage	3.16	13335.69	01.65
2	Sowing + Earthing Up + Mulching	1	32635.24	04.06
3	Cost of mulching material		16012.08	01.99
4	Seed rhizome (q)	9.02	355453.35	44.19
5	Farmyard manure (FYM) (q) and Fertiliser (kg)	79.75 and (41.47:0:0)	10713.32	1.33
6	Irrigation (Tank)	5.18	3836.23	0.47
7	Plant protection chemicals	1.37	7014.26	0.87
8	Manual hoeing /weeding	3.49	36036.57	4.48
9	Harvesting, cleaning and sorting		57861.68	7.20
10	Post harvest charges		90466.52	11.25
11	Miscellaneous		598.60	0.07
12	Interest on working capital (3.5 %)		21837.98	2.71
13	Variable cost		645781.02	80.28
14	Management charges (10 %)		64578.10	8.03
15	Risk factor (10 %)		64578.10	8.03
16	Rental value of land		29420.47	3.66
17	Total cost		804357.45	100

**Fig. 2.** Percent of various costs to total cost of ginger cultivation in Haryana.**Gross returns and net income per hectare**

The returns from the cultivation of ginger, specifically for dried ginger, were calculated and presented in Table 3. The yield of fresh ginger was 108.01q/ha, whereas that of dried ginger was 21.60 q/ha. The fresh ginger yield findings from this research align with a previous research (13). Gross returns were estimated using the prevailing producer-level price of dried ginger at ₹39276.66/q, which is influenced by factors such as supply-demand dynamics, weather conditions, production costs, transportation expenses, market competition and seasonal fluctuations (14). The price of dried ginger was ₹39276.66/q. Dried ginger gives a return of ₹202594.08/ha over the variable cost. The gross returns obtained were ₹848375.84/ha and net returns were ₹44017.65/ha with a

B : C ratio of 1.31 over variable cost and 1.05 over total cost. These findings were in line with previous studies, which reported a B : C ratio of 1.10 and 1.26 respectively (11, 15).

Resource use efficiency of ginger cultivation

The analysis of the Cobb-Douglas production function offers valuable insights into the resource use efficiency in ginger production, as detailed in Tables 4 and 5. The coefficient of determination (R^2) was 0.95, indicating that the inputs used in the production function model account for most of the variation in ginger production. Additionally, to confirm the absence of multicollinearity, the variance inflation factor (VIF) test was conducted, which confirms its absence in the data. The returns to

Table 3. Returns from ginger cultivation in the Panchkula district of Haryana

Sl. No.	Particulars	No./Qty	Value (₹/ha)
1	Total variable cost	-	645781.02
2	Total cost	-	804357.45
3	Output		
3	i. Raw ginger production (q/ha)	108.01	-
3	ii. Dry ginger production (q/ha)	21.60	848375.84
4	Gross returns	-	848375.84
5	Returns over variable cost	-	202594.08
6	Net returns	-	44017.65
7	B:C over variable cost	-	1.31
8	B:C over total cost	-	1.05

Table 4. Estimated value of the coefficients and related statistics of the Cobb-Douglas production function

Factors	Coefficient	Standard error	t-value	p-value
Constant	4.19*	1.09	3.84	< 0.001
Seed rhizome	0.34*	0.04	9.63	< 0.001
Fertiliser and farmyard manure (FYM)	0.06*	0.02	4.07	0.002
Plant protection	0.10*	0.03	3.16	< 0.001
Human labour	0.27*	0.09	3.07	0.003
R ² value	0.95			
Adjusted R ²	0.94			
F-ratio/F-calculated Value	329.61*	F-Critical value	2.49	
Returns to scale	0.77			

*represent 1 % level of significance.

Table 5. Measures of allocative efficiency of resources used in ginger production in Panchkula

Factors	Geometric mean of inputs	Coefficient	Marginal value product (MVP)	Marginal factor cost (MFC)	MVP/MFC (R)	Status of resource use	Per cent adjustment (D)
Seed rhizome	354545.25	0.34	0.81	1	0.81	Over utilised	-23.45
Fertiliser and farmyard manure (FYM)	9083.37	0.06	5.60	1	5.60	Under utilised	82.14
Plant protection	5816.78	0.10	14.57	1	14.57	Under utilised	93.13
Human labour	223524.95	0.27	1.02	1	1.02	Under utilised	1.96

scale for ginger production in the study area were determined to be 0.77, suggesting that the production process is characterised by diminishing returns to scale, which is also meaningful in the context of the Shivalik foothills. Most farmers in the study area operate on marginal and small holdings, often in fragmented terrace and upland plots, where management is difficult and economies of scale are limited. Similar to the present findings, previous studies reported returns to scale values of 0.78 and 0.88 respectively, both of which were below one and therefore indicated diminishing returns to scale (2, 10). The variables such as seed rhizome, fertiliser and FYM, plant protection and human labour were found to be positively significant at 1 % level of significance.

The estimated MVP/MFC ratio (RUE) for various input resources used in production indicates their utilisation levels. Inputs such as plant protection, fertiliser (including FYM) and human labour showed positive RUE > 1, suggesting under-utilisation; however, any increase in these inputs must still consider farmers' liquidity, timely input availability, irrigation security and the risks associated with rain-fed farming. Conversely, the seed rhizome had a positive RUE < 1, indicating over-utilisation. The adjustment in the MVP for optimal resource use suggested that for optimal allocation of resources such as FYM and fertiliser, plant protection and human labour were required to be increased by approximately 82.14 %, 93.13 % and 01.96 %, respectively. On the other hand, seed rhizome costs were required to be reduced by 23.45 % respectively. Similar to the findings of this research, it is also reported that labour and fertiliser (including FYM) are being under-utilised, but the other two variables (seed rhizome and plant protection) findings were consistent with the author (11, 16, 17).

Constraints in the production of ginger crop

Ginger holds significant economic importance in Haryana as a high-value spice crop, contributing to farmers' income through its medicinal, culinary and industrial applications, while supporting

local processing units and exports from the state. The Shivalik foothills provide an ideal agro-climatic zone for ginger cultivation due to their well-drained loamy soils, moderate temperatures, high humidity and ample monsoon rainfall, which match the crop's requirements for optimal growth and yield.

At present, farmers face numerous challenges in the production of spices. This study focuses on the problems encountered by ginger growers in the Panchkula district of Haryana. The primary concerns faced by these growers, which contribute to reduced yield at the field level, are listed in Table 6. High cost of quality seed rhizome due to unavailability in the local area was the major problem. Inadequate irrigation facilities were also a major concern as it reduces the effective response of FYM and fertiliser, so farmers may not use these inputs most efficiently. Unfavourable weather conditions, such as late arrival of monsoon and erratic rains, reduce the crop area and production. These findings are in coherence with some previous studies (18, 19).

Our research findings optimise resource use: reduce over-utilised seed rhizomes to cut high costs/unavailability; boost under-utilised fertilisers and plant protection for better irrigation resilience and pest management. Also recommends subsidies, mechanisation and extension services to resolve constraints that lead to high costs of cultivation.

Conclusion

The cost and returns analysis of ginger (*Zingiber officinale*) production in the Shivalik foothills of Panchkula district of Haryana provides key insights for policymakers and researchers. Ginger cultivation in the district showed a decreasing return to scale, which indicates that output increases less than the proportionate increase in inputs. Ginger production is a highly labour-intensive enterprise and in addition, the planting material is voluminous, which burdens the farmers. In addition, the farmer faced a short

Table 6. Constraints in production of ginger in Panchkula district of Haryana

Sl. No.	Constraints	Number of farmers	Percentage (%)
1	High cost of quality seed rhizome	78	97.50
2	Non-availability of quality seed rhizome	77	96.25
3	Inadequate irrigation facility	73	91.25
4	Non-favourable weather condition like erratic rainfall	45	56.25
5	Lack of adequate technical knowledge regarding pests and diseases (rhizome rot, rhizome scale etc)	31	38.75

supply of quality seed rhizomes due to unavailability in the local market. Thus, in order to address these problems, the government should take initiatives to spread awareness about the existing subsidies available for horticultural crops. Also, custom hiring centres in the district should emphasise creating services of small farm machinery like power-tillers and other hand-driven tools. Apart from this, horticulture departments should strengthen the extension services and offer entrepreneurship training programs to support the farmers.

Acknowledgements

We gratefully acknowledge the Department of Agricultural Economics, CCS Haryana Agricultural University, Hisar, Haryana, for providing facilities and technical support for this research.

Authors' contributions

A conducted the research and drafted the manuscript. GS designed the study, edited the manuscript and helped in coordination. JSP participated in the design of the study, manuscript editing and performed the statistical analysis. VS and AS assisted in the study and contributed to data collection. All authors read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest: Authors do not have any conflict of interest to declare.

Ethical issues: None

References

1. Tripathi T. Spices in Indian history: a multifaceted exploration of trade, medicine and religious practices. *Int J Appl Res.* 2024;10(8):4–11. <https://doi.org/10.22271/allresearch.2024.v10.i8a.11909>
2. Acharya N, Acharya B, Dhungana SM, Bist V. Production economics of ginger (*Zingiber officinale* Roscoe) in Salyan District of Nepal. *Arch Agric Environ Sci.* 2019;4(4):424–27. <https://doi.org/10.26832/24566632.2019.040408>
3. Food and Agriculture Organisation. World food and agriculture: statistical yearbook 2023. Rome: FAO; 2024. <https://www.fao.org/home/en>
4. Directorate of Economics and Statistics. Agricultural statistics at a glance 2024. New Delhi: Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India; 2025. <https://desagri.gov.in/>
5. Singh J, Nigar I, Kumar D, Sharma S, Kumar H, Rani D, et al. Health benefits of ginger: a review. *J Ayurvedic Herb Med.* 2024;10(2):49–55. <https://doi.org/10.31254/jahm.2024.10205>
6. Yadav RP, Panwar P, Arya SL, Mishra PK. Revisit of Shivalik region in different states of northwestern India. *J Geol Soc India.* 2015;86:351–60. <https://doi.org/10.1007/s12594-015-0322-4>
7. Pandey R, Adhikari K, Dhakal S, Timsina K. Economics of ginger production in Ilam District, Nepal. *IAAS Res Rep.* 2015;2:41–45.
8. Heady EO, Dillon JL. Agricultural production functions. *Am J Agric Econ.* 1961;43:978–79. <https://doi.org/10.2307/1236037>

9. Sapkota M, Bajracharya M. Resource use efficiency analysis for potato production in Nepal. *J Nepal Agric Res Coun.* 2018;4:54–59. <https://doi.org/10.3126/jnarc.v4i1.19690>
10. Gurung B, Regmi R, Paudel A, Paudel U, Paudel A, Shrestha S. Profitability, marketing and resource use efficiency of ginger production in Rukum West, Nepal. *Arch Agric Environ Sci.* 2021;6(4):426–35. <https://doi.org/10.26832/24566632.2021.060403>
11. Shrestha A, Dhakal S, Marahatta S, Koirala A. Resource use efficiency and economies of scale for ginger production in Ilam District, Nepal. *Int J Agric Environ Food Sci.* 2021;5(4):645–50. <https://doi.org/10.31015/jaefs.2021.4.25>
12. Kadam AS, Suryawanshi RR, Dhengale SS, Shinde HR. Economic analysis of production of ginger in Sangli District of Maharashtra. *Int J Chem Stud.* 2019;7(6):1456–60.
13. Chalise DP, Ghimire S, Neupane J, Devkota K. Economics of production and marketing of ginger in Sunsari District, Nepal. *Acta Sci Agric.* 2019;3(11):193–98. <https://doi.org/10.31080/ASAG.2019.03.0707>
14. Singh R, Feroze SM. Price gap between producers and consumers of ginger: empirical evidence from North Eastern Hill Region. *Indian J Agric Econ.* 2018;73(3):309–27. <https://doi.org/10.22004/ag.econ.343373>
15. Ghimire A, Shah M. Economics of production and marketing of ginger in Sindhuli District, Nepal. *Agric Ext Dev Ctries.* 2023;1(2):52–58. <https://doi.org/10.26480/aedc.02.2023.52.58>
16. Anamayi SE, Anamayi RM. Resource use efficiency in ginger production in Jaba Local Government Area of Kaduna State. *IOSR J Humanit Soc Sci.* 2018;23(7):14–21. <https://doi.org/10.9790/0837-2307031421>
17. Roy K, Kalita DC. Resource use efficiency in ginger production in the West Garo Hills District of Meghalaya. *Environ Ecol.* 2024;42(3A):1283–86. <https://doi.org/10.60151/envec/EPT05174>
18. Kumar S, Singh SP, Sharma RR. Constraints perceived by the farmers in adoption of improved ginger production technology: a study of low hills of Himachal Pradesh. *Int J Bio-resour Stress Manag.* 2018;9(6):740–44. <https://doi.org/10.23910/IJBSM/2018.9.6.1911>
19. Thakur S. Economics and marketing management of ginger and turmeric crops in Reasi District of Jammu Region [dissertation]. Jammu: Sher-e-Kashmir University of Agricultural Sciences and Technology; 2024. <https://krishikosh.egranth.ac.in/items/5f1ba749-9dfb-42fc-a016-9d8a423443bb>

Additional information

Peer review: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

Reprints & permissions information is available at https://horizonpublishing.com/journals/index.php/PST/open_access_policy

Publisher's Note: Horizon e-Publishing Group remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Indexing: Plant Science Today, published by Horizon e-Publishing Group, is covered by Scopus, Web of Science, BIOSIS Previews, Clarivate Analytics, NAAS, UGC Care, etc. See https://horizonpublishing.com/journals/index.php/PST/indexing_abstracting

Copyright: © The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited (<https://creativecommons.org/licenses/by/4.0/>)

Publisher information: Plant Science Today is published by HORIZON e-Publishing Group with support from Empirion Publishers Private Limited, Thiruvananthapuram, India.