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Cost and return of custard apple in Kanker district of Chhattisgarh

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Abstract

The study conducted “cost and return of custard apple in Kanker district of Chhattisgarh”. Kanker and Charama blocks were selected for study. Three villages were selected from each block and totally 20 fruit growers selected from villages by using random sampling technique. The study is based on primary data. Primary data was collected from the selected fruit growers through questionnaires schedule. The total establishment cost of overall farms (initial investment cost and maintenance cost) during gestation period was observed as Rs. 11083.17 and per quintal cost of production of selected fruit during bearing period (5th year onward) was Rs. 752.46, Rs. per hectare for custard apple. Per hectare net profit at input cost for custard apple was Rs. 24681.28. Benefit-cost ratio custard apple was 4.31 rupees on invest of one rupee, while Input – output ratio of mango was 5.31 rupees.

Keywords: custard apple, establishment cost, cost of production, BCR, input-output ratio

Introduction

Fruit crops area an important part of agricultural production. India is the world’s second largest producer of fruits and vegetables. Horticulture contributes for only 17% of the land area and 30% of agricultural GDP. In the last few years, horticultural production in India has increased. Horticultural crops are characterized by high productivity, high income, great potential for employment creation and export, relatively low water demand and easy adaptation to unfavorable soil and waste land conditions. The input-output ratio of most horticultural crops is much higher than that of field crops. Their role in improving the environment is an added benefit.

The total area of fruit crops in the state during study year 2, 58, 630 hectares, and the production in 2019-20 was 25, 48,930 MT. The total area of fruit crops in the Kanker region is 10,019 hectares, and the output in 2019-20 is 76,158.1 MT.

In India, from 2017-18, the total area of custard apples cultivation (*Annona squamosa* L.) was 46 thousand hectares and the yield was 401 thousand MT, while the area of custard apple in Rajasthan was 241.65 hectares (0.54%) and the yield was 1481.49 MT (0.40%), which shows that Rajasthan plays an important role in the area and production of custard apples in India (Annual Report, Directorate of Horticulture, Government of Rajasthan, 2018).

In Chhattisgarh, it is cultivated in Bastar, Dantewada, Kanker, Rajnandgaon, Kabirdham, Korba, Mahasamund and Korba district. Located in the northern part of Bastar division, Kanker sub region, around 150 km. In places far away from here, the production of 6,000 tons of custard apple has been recorded. According to the 2019-20 data, the production of custard apples in Kanker of the state is 1,540 hectare and the output is 6,591.20 MT. (Source - Assistant Director of Horticulture Kanker).

Methodology

The study conducted was Chhattisgarh state, Kanker district was selected for the study purpose because the maximum fruit cropping area is in Bastar division, which 2 block (Kanker and Charama) were selected purposively for the study. Sample of six villages were randomly selected for the study viz: Bhiroud, Aawri, Bharritola, Devri, Lalmatwada and Khartha. Three villages selected to each blocks. A multi-stage sampling method was adopted in the selection of fruit growers. Total 20 respondents selected to both block. Ten farmers selected to each block. The data was collected using personal interview method and prepared questionnaire schedule.

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Analytical Tools

Estimation of cost and return

The total cost of cultivation were divided into-

(i) Establishment costs and (ii) Maintenance costs

Establishment costs: It was the cost incurred during the establishment of a fruits plantation. This cost comprised of land preparation, digging of pits, planting material and its transportation, weeding, manures and fertilizers, plant protection chemicals and all other after care operation during the establishment period (up to 4th years from the data planting of the crop).

Maintenance costs: It includes all the costs incurred annually for the maintenance and production in the fruits plantation from the 5th year onward till the end of life span (productive year). It consisted of (a) annual fixed cost and (b) annual variable cost. The annual fixed cost included apportioned annual share of establishment cost, land tax, repairs and maintenance of building and machines, depreciation and interest on fixed capital. The annual variable cost included of human labor cost, cost of machine power, material cost (plant protection chemicals, manures and fertilizers, etc) and interest on working capital.

The data collected from the fruit growers are used for estimating cost and returns structure by using fixed and variable cost.

- Total cost = Total fixed cost + Total variable cost
- Gross income (Rs.) = Total Yield (kg) × Market Price of the crop (Rs. /kg)

$$c. \text{ t income (Rs.)} = \text{Gross income} - \text{Total cost}$$

$$d. \text{ Cost of production (Rs. / qt.)} = \frac{\text{Total Cost}}{\text{Yield}}$$

$$e. \text{ Input - output ratio} = \frac{\text{Total Return}}{\text{Total Cost}}$$

$$f. \text{ Benefit - Cost ratio} = \frac{\text{Net Return}}{\text{Total Cost}}$$

Results and Discussion

Cost and returns of custard apple

Initial investment cost (1st year)

In Kanker district, cost of establishment of custard apple orchard of overall farms per hectare for four years was Rs. 11083.17. Initial establishment costs such as planting material, gap filling and fencing account for 35.15 per cent of total establishment cost. Total investment cost of custard apple was found to be Rs. 3896.38.

Maintenance cost during gestation period (from 2nd year to 4th year)

The maintenance cost incurred by the custard apple growers during the gestation period is presented in the Table 1. The results revealed that in Kanker district, total maintenance cost during gestation period (up to fourth year) accounted to Rs. 7186.79 of which cost of Rs.2696.42, Rs.2182.36, and Rs. 2308.01 occurred during second, third and fourth years respectively. Hence the total establishment cost was accounted to Rs. 11083.17.

Table 1: Establishment cost of custard apple orchard (Rs. /ha)

S. No.	Operation	Establishment cost				Overall percent
		Initial investment cost	Maintenance cost			
			2 nd year	3 rd year	4 th year	
1.	Field preparation	-	-	-	-	-
2.	Labor cost	2350.00	1500.00	1230.89	1250.69	6331.58 (57.12)
3.	Planting material	500.00	-	-	-	500.00 (4.51)
4.	Application of fertilizers and manure	350.00	340.50	375.80	480.45	1546.75 (13.96)
5.	Irrigation	50.00	50.00	100.00	100.00	300.00 (2.70)
6.	Fencing	245.40	355.47	-	-	600.87 (5.42)
7.	Plant protection chemical	100.98	150.45	155.67	157.32	564.42 (5.10)
8.	Miscellaneous charges	300.00	300.00	320.00	320.00	1240.00 (11.19)
	Total cost	3896.38 (35.15)	2696.42 (24.32)	2182.36 (19.70)	2308.01 (20.83)	11083.17 (100%)

Cost of cultivation of custard apple orchard (5th year onwards)

The cost of cultivation of custard apple in Kanker district is presented in Table 2 In Kanker district, total cost incurred in cultivation of cashew apple orchard was found to be Rs. 5718.72 of which variable cost accounts Rs.5197.72 (90.89% of the total cost) and fixed cost accounts Rs. 520.80 (9.11% of the total cost). Among labour cost was found to be highest accounting Rs. 3750.60 followed by cost of manure and

fertilizers accounting to Rs.450 and depreciation of fixed capital Rs. 450.

Total cost of production of overall farms was Rs.5718.72. The prevailing rate in the market during the period under study was Rs. 40 per kg. The gross income received from custard apple was observed to be Rs. 30400. The net profit at total cost was Rs.24681.28. Input- output ratio was 5.31 and benefit-cost ratio of custard apple was 4.31 rupees. Per quintal production cost of custard apple was Rs. 752.46.

Table 2: Cost and return of custard apple production (Rs. /ha)

S. No.	Particulars	Value (Rs.)	Percent (%)
	Annual fixed cost		
1.	Depreciation	450.00	86.40
2.	Land Revenue	15.00	2.89
3.	Interest on fixed capital @ 12%	55.80	10.71
	Sub Total	520.80	9.11
	Annual variable cost		
4.	Human labor	3750.60	72.16

5.	Manure and fertilizers	450.40	8.67
6.	Plant protection chemicals	340.00	6.54
7.	Irrigation charges	100.00	1.92
8.	Interest on working capital @ 12%	556.92	10.71
	Sub Total	5197.92	90.89
	Total cost (TFC + TVC)	5718.72	
	Yield (qt. /ha.)	7.6	
	Price (per kg.)	40	
	Gross income (Rs.)	30400.00	
	Net income (Rs.)	24681.28	
	Cost of production (Rs. /qt.)	752.46	
	Input - Output ratio	5.31	
	Benefit-cost ratio	4.31	

Summary and Conclusion

Fruits are essential for human balance diet and good health. Fruits are good sources of vitamins and minerals without which human body cannot proper health and develop resistance to disease they also contain pectin, cellulose, fats, proteins etc.

- The initial investment cost of custard apple orchard during first year in Kanker district was Rs. 3896.38.
- Total maintenance cost of custard apple orchard (second, third and fourth year) in Kanker district was Rs. 7186.79.
- The annual total cost of production of custard apple orchard during fifth year establishment of orchard in Kanker district was Rs. 5718.72 per ha.
- In Kanker district total yield obtained overall farms was 7.6 qt of custard apple per ha. Average price per kg of fruit obtained was Rs. 40. Farmer realized higher gross return of Rs. 30400 and net return of Rs. 24681.28 with return of Rs. 4.31 for every rupees of invest.
- Input – output ratio of custard apple was 5.31 rupees.

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