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Pranav S Belkar
PG Scholar, Agricultural Economics and Statistics Section, College of Agriculture, Nagpur, Maharashtra, India

Dr. MS More
Assistant Professor, Agricultural Economics and Statistics Section, College of Agriculture, Nagpur, Maharashtra, India

Dr. Sunita N Suryawanshi
Assistant Professor, Agricultural Economics and Statistics Section, College of Agriculture, Nagpur, Maharashtra, India

Dr. VJ Rathod
Associate Professor, Agricultural Economics and Statistics Section, College of Agriculture, Nagpur, Maharashtra, India

Dr. MK Rathod
Associate Professor, Agricultural Extension Education Section, College of Agriculture, Nagpur, Maharashtra, India

Vedangini D Gite
PG Scholar, Agricultural Economics and Statistics Section, College of Agriculture, Nagpur, Maharashtra, India

Corresponding Author:
Pranav S Belkar
PG Scholar, Agricultural Economics and Statistics Section, College of Agriculture, Nagpur, Maharashtra, India

Economic analysis of linseed in Chandrapur District of Vidarbha region

Pranav S Belkar, MS More, Sunita N Suryawanshi, VJ Rathod, MK Rathod and Vedangini D Gite

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Abstract
The present study was undertaken in Chimur and Naghid tehsils of Chandrapur District of Maharashtra. The present study analyzes the cost structure, returns, and constraints associated with linseed cultivation in the selected region. Detailed data on per hectare input utilization revealed that major expenditures were incurred on hired human labour (22.99%), machine charges (12.96%), and manure (8.46%). The total cost of cultivation per hectare at cost C_3 was estimated at ₹43,007.26, with gross returns amounting to ₹56,283.58. The net return at cost C_3 was ₹13,276.32, resulting in an input-output ratio of 1:1.30, indicating the economic viability of linseed cultivation. However, several constraints were identified at the production stage. At the production level, the unavailability of threshers (75.50%), zero tillage seed drills (68.33%), and labour during peak periods (62.50%) were the major constraints.

Keywords: Linseed, cost and returns, cultivation, constraints

Introduction
Linseed (*Linum usitatissimum* L.) ranks among the earliest cultivated plants, thriving in approximately 47 nations with the aim of producing seed oil. It is chiefly grown for its high-quality fiber, which is utilized in producing linen textiles and various other goods. In India, the cultivation mainly targets seeds that are harvested for oil extraction. The seeds possess an oil content ranging between 33 and 47 percent. Linseed oil serves as an excellent drying agent frequently employed in the creation of paints, varnishes, oilcloth, waterproof materials, linoleum, and, in certain locations, as an edible oil. The residue known as linseed-cake is a highly beneficial organic fertilizer and animal feed. Linseed cake is used as the animal feed and manure. It is also used in making paper and plastics. It is grown in the states of Madhya Pradesh, Utter Pradesh, Bihar, Chhattisgarh, and Maharashtra. India is one of the major oilseeds grower and importer of edible oils. India's vegetable oil economy is world's fourth largest after USA, China & Brazil. In India, it is grown mainly for seed used for extracting oil. Now days, due to omegs-3, it has gain strong importance in pharmaceutical sector. The oilseed accounts for 13 per cent of the Gross Cropped Area, 3 per cent of the Gross National Product and 10 per cent value of all agricultural commodities. In India three states which has major share in production of Linseed are Madhya Pradesh, Uttar Pradesh and Jharkhand. In India during year 2024-25 the area under Linseed was 18836 thousand hectares while the production accounts for 11932 thousand tonnes of Linseed. Maharashtra is one of the leading oilseed growing state in India. Maharashtra state occupies prominent place in area and production of oilseed crop grown in our country. In Maharashtra State during 2024-25, area covered under Linseed is 5.30 thousand hectares with production of 2.46 thousand tonnes.

With the following objectives

1. To estimates the cost and returns of linseed.
2. To identify the constraints during production of linseed.

Materials and Methods
The primary data was collected for the year 2024-2025.Multi-stage sampling design was adopted for the selection of linseed growing farmers. Linseed is a rabi crop grown in Chandrapur district of vidarbha region. Two tehsils were selected from Chandrapur district

and four villages were selected from each tehsils. The total 120 farmers were selected. To work out cost of cultivation standard method of cost of cultivation will be adopted which includes Cost A, Cost B, Cost C.
These cost concepts and items of costs included under each cost are given below.

Cost A1

- Value of hired human labour.
- Value of hired bullock labour.
- Value of owned bullock labour.
- Value of owned machine labour.
- Hired machinery charges.
- Value of seed (Both farm produced and purchased).
- Value of manure (Owned and purchase).
- Value of fertilizers.
- Irrigation charges.
- Value of insecticides and pesticides.
- Depreciation on implements and farm building.
- Land revenue and other taxes.
- Interest on working capital.
- Miscellaneous expenses (Artisans etc.).

Cost A_2 = Cost A_1 + Rent paid for leased in land
Cost B_1 = Cost A_1 + Interest on value of owned capital assets (excluding land)
Cost B_2 = Cost B_1 + Rental value of owned land (net land revenue) less land revenue + Rent paid for leased in land.
Cost C_1 = Cost B_1 + Imputed value of family labour.
Cost C_2 = Cost B_2 + Imputed value of family labour.
Cost C_3 = Cost C_2 + 10 percent of Cost C_2 on account of managerial functions performed by farmers

- **Interest on working capital:** It was calculated @6% per annum for half of the crop period
- **Interest on fixed capital:** It was calculated @10% per annum for the crop period.
- **Rental value of owned land:** It was calculated based on the prevailing rated in the sampling villages.
- **Depreciation:** It means the decrease in the value of an asset through wear and tear. The straight-line method was used to work out depreciation.

$$\text{Depreciation} = \frac{\text{Purchase price of the asset} - \text{Junk value (10\%)}}{\text{No.of useful years (expected life)}}$$

Income measures

a) **Gross income:** The gross returns of the farmers under the present study was estimated from returns obtained by the sale of main produce and by produce.
b) **Net returns:** Net returns were computed at different costs i.e. cost 'A1', cost 'A2', cost 'B1', cost 'B2', cost 'C1', cost 'C2' and cost 'C3' by deducting respective costs from the gross returns.
c) **Input Output ratio:** It is a ratio between the value of gross output and the cost of cultivation at different cost concepts

Simple tabular analysis will be used to identify the constraint during production of linseed.

Results and Discussion

The productivity and income from the crop production can be judged in better way, if we analyse it with respect to the different costs incurred during cultivation of a particular crop. The cost of cultivation and cost of production of any crop is the most important aspect of the farm economy both at micro and macro level point of view.

Per hectare input utilization pattern of selected linseed farmers

The degree of the management of the resources can be judged for the utilization of resources, the choice and decision-making. Besides this, it also indicates the level of technology adopted by the farmers. It is observed from Table 1. The per hectare input utilization on seed was 24.14 kg (Rs.1450.81), manure was 6.50 qtl (Rs. 3640.98) and fertilizer containing nitrogen and phosphorous 29.14 kg (1034.47 Rs.), 29.18 kg (1348.99 Rs.), respectively. Also, the per hectare input utilization on hired human labour, family labour, and machine charges were 34.63 days (Rs. 9890.19), 13.06 days (Rs.3503.07), 6.61 hours (Rs. 5576.26), respectively. From the table, it is observed that charges for, plant protection and Irrigation are Rs. 380.00 and Rs. 950.00, respectively.

Table 1: Per hectare input utilization pattern of selected linseed farmers

Sr No	Particular		Inputs/ha			
			Unit	Physical Unit	Monitory Units	Percentage
1	Hired human labour	Male	Days	12.28	4300.46	15.48
		Female	Days	22.35	5589.74	20.12
		Sub total		34.63	9890.19	
2	Family labour	Male	Days	10.56	3126.82	11.25
		Female	Days	2.50	376.25	1.35
		Sub total		13.06	3503.07	
3	Seed		Kg	24.14	1450.81	5.22
4	Machine		Hrs	6.61	5576.26	20.07
5	Manure		Qtl	6.50	3640.98	13.10
6	Fertilizer	N	Kg	29.14	1034.47	3.72
		P	Kg	29.18	1348.99	4.85
7	Plant Protection		Rs	-	380.00	1.36
8	Irrigation		Rs	-	950.50	3.42
9	Total		Rs	-	27775.28	100

Per hectare cost of cultivation of Linseed

It is revealed that from Table 2. per hectare, the cost of cultivation at cost 'A1' and cost 'A2' was Rs. 25960.50, cost B1 was 26700.10 and cost 'B2' was Rs. 35970.70, cost 'C1' was Rs.30203.16, cost 'C2' was Rs. 39097.51 and cost 'C3' was Rs. 43007.26.The major share of the cost of cultivation goes towards cost 'A1' and cost 'A2' (60.36 per cent). In costs 'A1' and 'A2', the major share was of hired

human labour i.e. (22.99 per cent) followed by machine charges (12.96 per cent), manure (8.46 per cent), irrigation charges (2.21 per cent), fertilizers (5.54 per cent), seed (3.37 per cent) and plant protection charges (0.88 per cent). All the above inputs are cash inputs or which farmers are required to pay immediately from their pocket. Cost 'B1' contributes (62.08 per cent), and cost 'B2' contributes (83.63 per cent) to the total cost i.e. cost 'C3'. The share of family labour was 8.14 per cent. Per hectare yield obtained by farmers was 10.52 quintal with a gross return of Rs. 56283.58.

Table 2: Per hectare cost of cultivation of Linseed

Sr. No.	Particular		Units	Units Required	Price Per unit	Total per cost per hectare (Rs.)	Per cent to total cost "C3"
1	Hired Human Labour	Male	Days	12.28	350.20	4300.46	9.99
		Female	Days	22.35	250.10	5589.74	12.99
		Sub-Total	Days	34.63		9890.19	22.99
3	Machine	Hired	Days	6.61	843.61	5576.26	12.96
4	Seed		Kg.	24.14	60.10	1450.81	3.37
5	Manure		Qtls.	6.50	560.15	3640.98	8.46
6	Fertilizer	N	Kg.	29.14	35.50	1034.47	2.40
		P	Kg.	29.18	46.23	1348.99	3.13
		Sub-Total		58.32	81.73	2383.46	5.54
						2383.46	5.54
7	Irrigation	Cost	Rs.			950.50	2.21
8	Incidental	Cost	Rs.			234.00	0.54
9	Plant Protection	Cost	Rs.			380.00	0.88
10	Repairs	Cost	Rs.			297.31	0.69
11	Working Capital	Cost	Rs.			24803.51	57.67
12	Int. On Working Capital @ 6% per annum	Cost	Rs.			744.11	1.73
13	Depriciation	Cost	Rs.			302.88	0.70
14	Land Revenue	Cost	Rs.			110.00	0.25
15	COST "A1"		Rs.			25960.50	60.36
16	Rent laid for leased land		Rs.			0	0
17	COST A2		Rs.			25960.50	60.36
18	Int. On Fixed Capital		Rs.			739.60	1.71
19	COST "B1"		Rs.			26700.10	62.08
20	Rental Value Of own Land		Rs.			9270.60	21.55
21	COST B2					35970.70	83.63
22	Family Labour Charges	Male	Rs.	10.56	296.10	3126.82	7.27
		Female	Days	2.50	150.50	376.25	0.87
		Sub-Total	Days	13.06	268.23	3503.07	8.14
23	COST"C1"		Rs.			30203.16	70.22
24	COST"C2"		Rs.			39097.51	90.90
25	10% COST"C2"		Rs.			3909.75	9.09
26	COST"C3"		Rs.			43007.26	100
27	Yield	Main	Qtls.	10.52	5350.15	56283.58	
28	Value Of Total Produce		Rs.			56283.58	
29	Per Qtl. Cost Of Production					4088.14	

Per hectare cost and returns from linseed cultivation

It is revealed from Table 3. That, on average gross returns worked out to Rs. 56283.58 and value of main produce was 10.52 (qtl/ha). The net returns obtained at various costs were Rs. 30323.08 at cost 'A1' and costs 'A2', Rs.29583.48 at cost 'B1', Rs. 20312.88 at cost 'B2, Rs. 39097.51 at cost 'C1', Rs. 17186.07 at cost 'C2' and Rs. 13276.32 at cost 'C3'. This means the Linseed crop appeared to be good for monitory benefits. The input-output ratio at cost 'C3' was 1:1.30. This indicates that on one rupee invested in the cultivation of Linseed earned Rs. 1.30

Table 3: Per hectare cost and returns from linseed cultivation

Sr. No.	Particulars	Total Cost/ha (Rs.)
1	Main produce (Qtl/ha)	10.52
2	Value of main produce	5350.15
3	Gross returns	56283.58
4	Cost of cultivation at	
	COST "A1"	25960.50
	COST A2	25960.50
	COST "B1"	26700.10
	COST B2	35970.70
	COST"C1"	30203.16
	COST"C2"	39097.51
	COST"C3"	43007.26
5	Net returns at	
	COST "A1"	30323.08

	COST A2	30323.08
	COST "B1"	29583.48
	COST B2	20312.88
	COST"C1"	39097.51
	COST"C2"	17186.07
	COST"C3"	13276.32
6	Input- Output ratio at	
	COST "A1"	2.16
	COST A2	2.16
	COST "B1"	2.10
	COST B2	1.56
	COST"C1"	1.86
	COST"C2"	1.43
	COST"C3"	1.30

Constraints during production of Linseed

From this table 3. It is observed that unavailability of Thresher was major problem which was expressed by 75.50 per cent farmers followed by 68.33 per cent farmers expressed as non-availability of zero tillage seed-drill, followed by 62.50 per cent farmers expressed as unavailability of labour during peak period and 54.16 per cent farmers expressed as unavailability of market. Delay sowing and inadequate dose of fertilizer were also problem faced by farmers**.**

Table 3: Constraints during production of linseed

Sr. No.	Constraints	Number of farmers faced the problem (120)	Percentage to total Cultivators	Rank
1.	Unavailability of Thresher	87	75.50	I
2.	Non-availability of zero tillage seed-drill	82	68.33	II
3.	Unavailability of labour during peak period	75	62.50	III
4.	Unavailability of market	65	54.16	IV
5.	Reduction in yield due to delay in sowing	56	46.66	V
6.	Inadequate use of the recommended dose of fertilizer	45	37.50	VI

Conclusion

The highest cost required is for machine charges in production of linseed followed by the cost of, hired human labour and manures. Per hectare total cost of cultivation of linseed i.e. cost 'C3' is Rs. 43007.26. The gross returns is Rs./ha 56283.58 and Net returns at cost 'C3' is Rs.13276.32.Input output ratio of linseed cultivation at cost 'C3' is 1:1.30. Unavailability of Thresher was major constraints which was expressed by 75.50 per cent farmers followed by 68.33 per cent farmers expressed as unavailability of zero tillage seed-drill, followed by 62.50 per cent farmers expressed as unavailability of labour during peak period and 54.16 per cent farmers expressed as unavailability of market.

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