



**COMPARATIVE ECONOMICS OF SUNFLOWER AND SAFFLOWER CULTIVATION OF WESTERN MAHARASHTRA**

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**Abstract:** Sunflower is a short duration crop; area under kharif sunflower in the year 2013-14 in Maharashtra was 32,800 ha while area in rabi sunflower was 51,700 ha. Safflower is also a short duration crop, Maharashtra is the key safflower producing state contributing 55 per cent of area i.e. 12,300 ha area comes under safflower cultivation The demand for oil of both the crops is increasing very tremendously as both the crops are rich in oil (45-50%) however, the area under both the crops is decreasing day by day. Therefore it is felt necessary to study the various reasons behind it; looking to the above problems the present study is undertaken.

Per hectare cost of cultivation of safflower and sunflower (i.e. Cost 'C') was worked out to Rs. 21133.10 and Rs. 24149.98, respectively. The per hectare gross income received from cultivation of safflower and sunflower was Rs.27478.83 and Rs.29859.74, respectively. It is indicated that safflower has obtained more gross income than the sunflower while in case of marketing the average marketing cost of safflower in channel-I was Rs.262.58 and in channel-II Rs.34.21. The major items of cost in the case of channel-I were commission charges (53.65 %), transportation (14.98 %), packaging charges (13.03 %) and weighing charges (3.81 %). While in case of marketing cost of sunflower in channel-I, it was Rs.251.95 and in channel-II Rs.34.34. The major items of cost in the case of channel-I were commission charges (52.09 %), transportation (11.31 %), packaging charges (12.39 %) and weighing charges (3.97 %).

**Key notes:** Sunflower, Safflower, Resource use levels, Cost of Cultivation and Marketing.

**Introduction**

Sunflower is a short duration crop which is adaptable to a wide range of agroclimatic situations, having high yield potential, suitable for cultivation in all seasons, due to its day neutral nature and can fit well in various inter and sequence cropping systems. In the year 2013-14, area under kharif sunflower in Maharashtra was 32,800 ha, out of that 4,600 ha in Solapur district while area in rabi sunflower was 51,700 ha out of that 9600 ha in Solapur district.

Safflower is also belonging to the same family as sunflower. It is a multi-purpose crop for oil, medicinal and industrial uses. Maharashtra is the key safflower producing state contributing 55 per cent of area i.e. 12,300 ha area comes under safflower cultivation out of that in Solapur district it comes to 2,400 ha. Exploitation of safflower as a source of pigment and for medicinal and nutritional uses may be the key intervention required to increase the popularity of this crop.

The demand for oil of both the crops is increasing very tremendously as both the crops are

rich in oil (45-50%) however, the area under both the crops is decreasing day by day. Therefore it is felt necessary to study the various reasons behind it, looking to the above problems the present study is undertaken in the year 2014-15, based on primary data collected from Solapur district and from Solapur district Akkalkot (Nagansur village), South Solapur (Sindkhed village) and Mangalwedha (Borale village) tahsils are very well known for cultivation of both safflower as well as sunflower was selected purposively with the specific objectives to study the input utilization for cultivation of sunflower and safflower, to study and compare the costs, returns and profitability of sunflower and safflower and suggest the remedial measures.

**Results**

**Resource use levels**

The information on utilization of different resources for cultivation of safflower and sunflower is presented in the Table 1.

**Table 1 Resource use levels of safflower and sunflower (Per ha)**

Sr. No.	Particulars	Safflower	Sunflower
1	Total Human labour (man-days)		
	a. Male	13.80	15.92
	b. Female	5.42	20.65
2	Bullock power ( pair days)	5.00	5.47
3	Machine power in hrs.	8.59	6.95
4	Manures (qtls.)	5.84	5.90
5	Fertilizers (kgs) N	30.50	23.59
	P	25.81	26.23
	K	1.41	4.32
7	Plant protection charges (Rs.)	407.39	574.32

It is seen from the Table 1 that, the total labour utilization per hectare was highest in sunflower as compared to safflower because of the harvesting of safflower is done through combine harvester while harvesting of sunflower through labour and thresher. The male and female labour utilization was 37.46 and 5.62 man days per hectare in case of safflower while 43.80 and 20.65 man days in cultivation of sunflower, respectively.

The bullock labour utilization was 5.00 and 5.47 pair days per hectare in case of safflower and

sunflower, respectively. The per hectare use of manure, nitrogen and phosphorus were 5.84 qtls, 30.50 kg and 25.81 kg per hectare in case of safflower and 5.90 qtls, 23.59 kg and 26.23 kg in cultivation of sunflower, respectively.

**Cost of cultivation of safflower and sunflower**

The per hectare cost of cultivation of safflower and sunflower on the sample farms during 2014-15 has been estimated and the same is represented in the Table 2.

**Table 2 Cost of cultivation of safflower and sunflower (Rs./ha)**

Sr. No.	Cost items	Safflower			Sunflower		
		Qty	Value	Percent	Qty	Value	Percent
1	Hired labour (man-days)						
	a. Male	6.98	1712.32	7.79	7.52	1835.50	8.11
	b. Female	3.03	443.84	2.02	15.88	2179.31	9.63
2	Bullock power ( pair days)	5.00	4445.74	20.23	5.47	4938.24	21.81
3	Machine power	8.59	1732.76	7.88	6.95	1384.36	6.11
4	Manures (qtls)	5.84	823.36	3.75	5.90	855.63	3.78
5	Fertilizers (kg) N	30.50	394.39	1.79	23.59	305.05	1.35
	P	25.81	648.66	2.95	26.23	659.10	2.91
	K	1.41	41.45	0.19	4.32	126.75	0.56
6	Plant protection charges (Rs)		407.39	1.85		574.32	2.54
7	Incidental charges (Rs)		203.00	0.92		301.25	1.33
8	Repairs (Rs)		311.14	1.42		111.40	0.49
	<b>Working capital (Rs)</b>		11164.04	<b>50.79</b>		13270.90	<b>58.62</b>
9	Int. on Working Capital		669.84	3.05		796.25	3.52
10	Depre. on farm implements		502.13	2.28		305.21	1.35
11	Land revenue and taxes		102.00	0.46		99.56	0.44
	<b>Cost 'A'</b>		12438.01	<b>56.59</b>		14471.92	<b>63.92</b>
12	Rental value of land		4477.81	20.37		4876.37	21.54
13	Int .on fixed capital		2152.5	9.79		1985.25	8.77
	<b>Cost 'B'</b>		19068.32	<b>86.75</b>		21333.54	<b>94.23</b>
14	Family labour Male	6.82	1706.20	7.76	8.40	2100.23	9.28
	Female	2.39	358.58	1.63	4.77	716.22	3.16
	<b>Cost 'C'</b>		21133.10	<b>100</b>		24149.98	<b>100.00</b>

<b>II</b>	<b>Output (qtls)</b>	10.22	27478.83		8.13	29859.74	
<b>III</b>	Per quintal cost		2067.10			2970.25	
	B:C ratio		<b>1.30</b>			<b>1.24</b>	

It is seen from the table that, per hectare cost of cultivation of safflower and sunflower (i.e. Cost 'C') was worked out to Rs. 21133.10 and Rs. 24149.98, respectively. Among the different items of costs, rental value of land was the highest (20.37 % and 21.54 %). The other important items of cost

were bullock labour (20.23 and 21.81 %), hired male labour (7.79 and 8.11 %), hired female labour (2.02 and 9.63 %) followed by interest on fixed capital (9.79 and 8.77 %). The cost incurred in respect of land revenue and other taxes and depreciation were negligible in the cost of cultivation.

### Resource use gap on safflower and sunflower farms

Table 3 Resource use gap on safflower and sunflower farms

(Per ha)

Sr. No.	Particulars	Crop	
		Safflower	Sunflower
<b>I</b>	<b>Seed (kg)</b>		
A	Recommended	10	8
B	Actual use	10.75	7.86
C	Gap	-0.75	0.14
D	Per cent gap	7.48	1.75
<b>II</b>	<b>Manure (qtls)</b>		
A	Recommended	20	20
B	Actual use	5.84	5.90
C	Gap	14.16	14.10
D	Per cent gap	70.80	70.50
<b>III</b>	<b>Nitrogen (kg)</b>		
A	Recommended	50	50
B	Actual use	30.50	23.59
C	Gap	19.50	26.41
D	Per cent gap	39.00	52.82
<b>IV</b>	<b>Phosphorus (kg)</b>		
A	Recommended	25	25
B	Actual use	25.81	26.23
C	Gap	-0.81	-1.23
D	Per cent gap	3.25	4.91
<b>V</b>	<b>Potash (kg)</b>		
A	Recommended	25	25
B	Actual use	1.41	4.32
C	Gap	23.59	20.68
D	Per cent gap	94.34	82.70
<b>VI</b>	<b>Yield (qtls)</b>		
A	Recommended	15.00	12
B	Actual yield	9.36	10.35
C	Gap	5.64	1.65
D	Per cent gap	37.60	13.75

In the total cost of cultivation of safflower and sunflower, the Cost 'A' was Rs.12438.01 and Rs.14471.92 (56.59 and 63.92 %), respectively and Cost 'B' was Rs.19068.32 and Rs. 21333.54 (86.75 and 94.23 %), respectively. The per quintal cost of

safflower and sunflower was Rs. 2067.10 and Rs. 2970.25.

Inputs play a significant role for boosting production of safflower and sunflower. The production of safflower and sunflower depends on

judicious and balanced use of inputs. In the light of these specific relationships between inputs and output of safflower and sunflower, the data have been analyzed further to work out the gaps in the actual use of levels and recommended levels of inputs and resultant output of safflower and sunflower on per hectare basis. The results obtained from the analysis are presented in Table 3.

It has been clearly indicated that less use in the seed quantity was observed than the recommended levels of inputs on sunflower farms while excess use was observed on safflower farms. Only in case of phosphorus fertilizer the excess use was observed on both safflower and sunflower farms and all other inputs the less use was observed in safflower and sunflower. Notable gap was observed in use of potash and manures which was 90.34 and 70.80 per cent and 82.70 and 70.50 per cent on safflower and sunflower farms, respectively. In case of nitrogen use, the gap was 39.00 and 52.82 per cent, respectively on safflower and sunflower farms. In case of yield, there were near about 37.60 and

13.75 per cent less returns received due to the less use of inputs on both safflower and sunflower farms.

#### Profitability of cultivation of safflower and sunflower

An attempt has been made to compare the per hectare gross income, different costs and the profit at different costs with net returns and the benefit cost ratio in cultivation of safflower and sunflower. The details are given in the Table 4.

It is seen from the table that, the per hectare gross income received from cultivation of safflower and sunflower was Rs. 27478.83 and Rs. 29859.74, respectively. It is indicated that safflower has obtained more gross income than the sunflower.

Per hectare profit at Cost 'A' was Rs. 15040.82 and Rs. 15387.82 in cultivation of safflower and sunflower, respectively. Whereas, the profit at Cost 'B' was Rs.8410.51 and Rs.8526.20, respectively. The per hectare total cost, i.e. Cost 'C' was Rs.21133.10 and Rs.24149.98, respectively. The profit at Cost 'C' was Rs.6345.73 and Rs.5709.74, respectively.

**Table 4 Costs, returns, gross income, and B.C.ratio for safflower and sunflower** (Per ha)

Sr. No.	Particulars	Crop	
		Safflower	Sunflower
1	Total cost		
	i) Cost 'A'	12438.01	14471.92
	ii) Cost 'B'	19068.32	21333.54
	iii) Cost 'C'	21133.10	24149.98
2	Profit at		
	i) Cost 'A'	15040.82	15387.82
	ii) Cost 'B'	8410.51	8526.20
	iii) Cost 'C'	6345.73	5709.76
3	Gross income	27478.83	29859.74
4	B:C ratio		
	i) Cost 'A'	2.21	2.06
	ii) Cost 'B'	1.44	1.40
	iii) Cost 'C'	1.30	1.24

From the above foregoing discussion, it is clear that the B:C ratio, gross income as well as profit at cost C was more in safflower than the sunflower. It indicates that safflower is more profitable than the sunflower.

#### Disposal pattern of safflower and sunflower on sample farm

The information regarding the disposal of safflower and sunflower is presented in Table 5.

**Table 5 Disposal pattern of safflower and sunflower on sample farm (qtls)**

Sr. No.	Particulars	Safflower	Sunflower
		Qty	Qty
A)	Production	276 (100)	227 (100)
B)	Quantity Consumed on farm		
	a) Home consumption for seed and extraction oil	0.08 (0.03)	0.05 (0.02)
	b) To relatives on gratis	0.10 (0.04)	0.07 (0.03)
	c) Losses due to spoilage and improper handling	1.00 (0.36)	1.80 (0.79)
	Subtotal	1.18 (0.43)	1.92 (0.84)
C)	Marketable surplus	274.82 (99.57)	225.08 (99.15)

(Figures in the parentheses indicate the percentage to the respective total)

It is seen from the table that 0.08 and 0.05 qtls, respectively from safflower and sunflower produce was retained for home consumption, 0.10 and 0.07 qtls, respectively of produce was given as gifts to relatives and 1.00 and 1.80 qtls, respectively of produce was lost due to spoilage and improper handling. It was observed that the majority of the produce (99.57 and 99.12 per cent) was available as marketable surplus for selling in market.

**Marketing channels**

The marketing system for assembling and distribution of safflower and sunflower consisted of producer and other intermediaries are as below.

1. Producer-Wholesaler/Commission agent-Retailer-Consumer

2. Producer-Village trader - Retailer- Consumer

In local market, the produce was sold directly to consumer or through retailers to the consumer. In case of markets such as Akkalkot, Mangalwedha and Solapur the safflower and sunflower send their produce through commission agents, then commission agent on receipt of produce, arranges for sale in these markets through open auction method of sale for safflower and sunflower, respectively.

**Marketing cost**

The per quintal cost of marketing of safflower and sunflower incurred through different agencies is given in Table 6.

**Table 6 Cost of marketing of safflower and sunflower (Rs.)**

Sr. No.	Particulars	Safflower		Sunflower	
		Channel-I	Channel-II	Channel-I	Channel-II
1.	Packaging charges	34.21 (13.03)	34.21 (88.79)	31.22 (12.39)	31.22 (90.91)
2.	Transportation	39.34 (14.98)	-	28.49 (11.31)	-
3.	Commission	140.88 (53.65)	-	131.24 (52.09)	-
4.	Weighing charges	10.00 (3.81)		10.00 (3.97)	
5.	Hamali	6.31 (2.40)	-	6.31 (2.50)	-
6.	Market fee	4.70 (1.79)	-	4.37 (1.73)	-

7.	Losses during transit	27.14 (10.33)	4.32 (11.21)	40.32 (16.00)	3.12 (9.09)
	Total market cost	262.58 (100)	38.53 (100)	251.95 (100)	34.34 (100)

(Figures in the parentheses indicate the percentage to the respective total)

It is revealed from the table that the average marketing cost of safflower in channel-I was Rs.262.58 and in channel-II Rs.38.53. The major items of cost in the case of channel-I were commission charges (53.65 %), transportation (14.98 %), packaging charges (13.03 %) and weighing charges (3.81 %). While in case of marketing cost of sunflower in channel-I, it was Rs.251.95 and in channel-II Rs.34.34. The major items of cost in the case of channel-I were commission charges (52.09 %), transportation (11.31 %), packaging charges (12.39 %) and weighing charges (3.97 %).

In the case of channel-II the total marketing cost formed packaging charges to an extent of 88.79 and 90.91 per cent, respectively in safflower and sunflower and losses during transit with 11.21 and 9.09 per cent, respectively.

#### Constraints in the cultivation safflower and sunflower

There are various constraints in cultivation of safflower as well as cultivation of sunflower among those, important constraints about the cultivation of safflower and sunflower are presented in Table 7 and 8.

**Table 7 Constraints in the cultivation and marketing of safflower**

Sr. No.	Particulars	Respondents	Percentage
1	High cost of various inputs	22	73.33
2	Improper selection of land	19	63.33
3	Non availability of pure seed	15	50.00
4	High cost of commission and transportation	28	93.33
5	Low net returns	26	86.66
6	Reducing prices of safflower during last few years	25	83.33
7	Mechanization difficulties (Harvesting problem in remote areas)	13	43.33
8	Small sowing window	12	40.00
9	Inadequate capital availability at the farmers side to carry out operations at proper time	18	60.00

Nearly 93.33 per cent cultivators faced the problem of high cost of commission and transportation charges and it was followed by low net returns (86.66%), reducing prices of safflower during last few days (83.33 %) and Cost of various inputs *viz.*, insecticides and pesticides etc. utilized in safflower cultivation was high (73.33 %). The other important problems were non availability of pure

seed, inadequate capital availability at the farmers side to carry out operations at proper time and small sowing window i.e. if sown earlier than optimum time it affects due to heavy infestation of aphids and if sown later, reduction in yield due to fungal diseases, mechanization difficulties as safflower is mainly cultivated on marginal lands hence mechanization can't be possible.

**Table 8 Constraints in the cultivation and marketing of sunflower**

Sr. No.	Particulars	Respondents	Percentage
1.	Poor seed setting	27	90.00
2.	Comparatively low rate for sunflower during harvesting period	26	86.66
2.	Low productivity level	24	80.00
4.	Nutrient constraints	28	93.33
5.	Plant protection constraints	25	83.33

6	Weather abnormalities during flowering to seed setting	09	30.00
7	Introduction of necrosis	11	36.66
8	Non availability of good quality seed	06	20.00
9	Inadequate capital availability at the farmers side to carry out operations at proper time	22	73.33

About 93.33 per cent of the sample cultivators opined that the sunflower crop is exhaustive and it removes more nutrients from the soil i.e. nutrient constraint (93.33%) followed by poor seed setting (90.00 %). Nearly, 86.66 per cent of the sample cultivators were suffered the problem of comparatively low rate for sunflower during harvesting period. Majority (83.33 per cent) cultivators reported the plant protection constraints i.e. sunflower are affected by a large number of insects and pests. The other factors were inadequate capital availability at the farmer's side to carry out operations at proper time, Introduction of necrosis and non availability of good quality seed.

### Conclusions

1. Per hectare cost of cultivation of safflower and sunflower (i.e. Cost 'C') was worked out to Rs. 21133.10 and Rs. 24149.98, respectively. Among the different items of costs, rental value of land was the highest (20.37 % and 21.54 %). The other important items of cost were bullock

labour (20.23 and 21.81 %), hired male labour (7.79 and 8.11 %), hired female labour (2.02 and 9.63 %) followed by interest on fixed capital (9.79 and 8.77 %).

2. The per hectare gross income received from cultivation of safflower and sunflower was Rs.27478.83 and Rs.29859.74, respectively. It is indicated that safflower has obtained more gross income than the sunflower.
3. The average marketing cost of safflower in channel-I was Rs.262.58 and in channel-II Rs.34.21. The major items of cost in the case of channel-I were commission charges (53.65 %), transportation (14.98 %), packaging charges (13.03 %) and weighing charges (3.81 %). While in case of marketing cost of sunflower in channel-I, it was Rs.251.95 and in channel-II Rs.34.34. The major items of cost in the case of channel-I were commission charges (52.09 %), transportation (11.31 %), packaging charges (12.39 %) and weighing charges (3.97 %).

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