



## “ANALYSIS ON THE COST OF SUNFLOWER PRODUCTION IN KARNATAKA”

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### Abstract

Sunflower (*Helianthus annuus*. L) is a important oilseed crop in India popularly known as “Surajmkuki”. The name “*Helianthus*” is derived from ‘*Helios*’ meaning ‘Sun’ and ‘*Anthos*’ meaning ‘Flower’. It is known as sunflower as it follows’ the sun by day always turning towards it’s direct rays ( sonawane Kg, Pokharkar VG and RR Nirgude 2019). It is one the fastest growing oilseed crop, Plant sunflower in the late spring season, once the ground is nice and warm most sunflower germinate when the soil has reached ’21 to 29°C. The best time to plant sunflower is just before the soil reaches this temperature of between 15 to 21 °C, for most areas this will be approximately 3 weeks after the last frost. It thrives best on deep loam soil with good drainage and irrigation facilities. The optimum range of soil pH for this crop is 6.5 to 8.5 to pH. Sunflower contains almost 70 different species those are Russian Mammoth, American Gaint, Sundance kid, Suntastic yellow, Eathwalker, Moulin Rouge, Strawberry blonde, Sunforest Mix. ‘Ukrain’(27%) is the largest sunflower producer in the world with 13,626,890 tonnes production volume per year. Russian federation (24%) comes second with 11,010,197 tonnes year production Ukraine and Russian federation produce together more than 50% of worlds total India is with 332,000 is ranked at 18 .Six states with Karnataka in the lead are the production of 3.04 lack tonnes from an area of 7.94 lack hectares followed by Andhrapradesh, Maharashtra, Bihar, Orissa, and Tamilnadu are major sunflower producing sunflower state of India. Major sunflower growing districts in Karnataka is Raichur, Bijapura, Ballari, Bidar, Chitradurga, Belagam, Gadaga, and Gulbarga. Sunflower is sown by Dibbling method which requires 5-6 kg seed per hectare, while furrow sowing need 8-10 kg per hectare.

**Keywords:** Production, Per Hectare, Irrigation, Sunflower.

### INTRODUCTION

Sunflower (*Helianthus annuus*. L) is a important oilseed crop in India popularly known as “Surajmkuki”. The name “*Helianthus*” is derived from ‘*Helios*’ meaning ‘Sun’ and ‘*Anthos*’ meaning ‘Flower’. It is known as sunflower as it follows’ the sun by day always turning towards it’s direct rays ( sonawane Kg, Pokharkar VG and RR Nirgude 2019). It is one the fastest growing oilseed crop, Plant sunflower in the late spring season, once the ground is nice and warm most sunflower germinate when the soil has reached ’21 to 29oC. The best time to plant sunflower is just before the soil reaches this temperature of between 15 to 21 oC, for most areas this will be approximately 3 weeks after the last frost. It thrives best on deep loam soil with good drainage and irrigation facilities. The optimum range of soil pH for this crop is 6.5 to 8.5 to pH. Instead the Districts which has got highest Average Total Cost and so that it is better to stop growing that particular crop in that Area and the district which has got least Average Total Cost it should be better to grow in that Area. Based on the results it is concluded that Sunflower cultivation has become non profitable in most of the districts which may be attributed to low yields and high cost of cultivation. Efforts are to be initiated to increase the yields and reduce the cost of cultivation by mobilizing the farmers to adopt good management practices to make Sunflower farming profitable and increase the area and production. From this study we can understand the importance of growing Sunflower in Karnataka. Sunflower contains almost 70 different species those are Russian Mammoth, American Gaint, Sundance kid, Suntastic yellow, Eathwalker, Moulin Rouge, Strawberry blonde, Sunforest Mix. ‘Ukrain’(27%) is the largest sunflower producer in the world with 13,626,890 tonnes



production volume per year. Russian federation (24%) comes second with 11,010,197 tonnes year production Ukraine and Russian federation produce together more than 50% of worlds total India is with 332,000 is ranked at 18 .Six states with Karnataka in the lead are the production of 3.04 lack tonnes from an area of 7.94 lack hectares followed by Andhrapradesh, Maharashtra, Bihara, Orissa, and Tamilnadu are major sunflower producing sunflower state of India. Major sunflower growing districts in Karnataka is Raichur, Bijapura, Ballari, Bidar, Chitradurga, Belagam, Gadaga, and Gulbarga. Sunflower is sown by Dibbling method which requires 5-6 kg seed per hectare, while furrow sowing need 8-10 kg per hectare.

Sunflower is a major source of vegetable oil in the world. It is used for a variety of cooking purpose sunflower seed contains about 46 to 52 % edible oil. The sunflower oil is considered premium compared to other vegetable oil as it is light yellow in colour. High level linoleic acid and absence of linolenic acid processes good flavour and high smoke point. Sunflower oil is a rich source (64%) of linoleic acid which is good for heart patients. Linoleic acid helps in washing out cholesterol deposition in the coronary arteries of the heart. The oil is also used for manufacturing hydrogenated. During 1965-2018, the gross collection of sunflower oilseeds production in the world increased from 7,985,3 thousand tons to 51,954,8 thousand tons is 6.5 times hiher (Vorobyov). The data provided on the export analysis shows that there are almost 98 countries and territories, which actively import sunflower from India. The combined vsalue of total export 65.41 USD Million, Viet Nam (28. USD), Bangladesh (14.76\$), Nepal (4.34\$), USA (2.69\$), Malaysia (2.14\$) Top countries for Sunflower export from India. (Google chrome).India has contracted 45,000 tonnes of Russian Sunflower oil at a record highest price for shipments in April as edible oil prices in the local market surged after supplies from rival Ukraine stopped, five industry officials told Reuters, Sunflower oil from Russia could help the world's biggest edible oil importer in easing the shortfall at a time when availability of vegetable oil is stretched because of Indonesia's decision to restrict palm oil supplies in present year (The Hindu, march 29, 2022).

### Literature Review

**Dalia Lewiun** flower (2006) Sunflower is considered one of the recalcitrant species in terms of transformation and regeneration. A routine transformation system of this crop requires competent cell cultures for efficient plant regeneration as well as an effective method for gene delivery. A transformation system was developed by an *Agrobacterium tumefaciens*-mediated method using split mature embryonic axis explants from the Ha89 genotype. Mean transformation efficiency obtained varied from 1 to 5.2% depending on the use of the EHA105 or the C58 strain containing a plasmid with a gene of agronomic interest.

**Shirshikar (2008)** The disease was observed during 1997 in Karnataka, a major sunflower growing state of India. Later, its occurrence was reported from almost all sunflower growing states of India, posing threat to sunflower cultivation. Presenstly no reliable resistant sources are available. The disease being viral in nature is very much difficult to combat by single approach.

**Shanwad U.K (2010)** Sunflower (*Helianthus annuus L.*), was introduced during seventies as an oil seed crop to India, It gained importance and popularity as a commercial oilseed crop of India under rainfed conditions. This is due to its suitability to many agro ecological regions, short duration, good quality oil and market price.

**Alexander Kandakov (2012)** Sunflower is one of the most important oil crops in the world production and the area under sunflower is in constant increase. In the Republic of Moldova sunflower is one of the most important crops, along with wheat, barley and corn, specifically in terms of cultivated areas Lands under sunflower for oil processing are registered in all geographical zones of Moldova (the North, the Center, and the South) and include every administrative region.

**Singha and Chakraborty (2013)** As the state of Karnataka covers second largest share of dry-land farming in India, emphasising more on the conventional rain-fed cultivation like paddy is little preferred by the farmers, especially in the northern Karnataka. Therefore, the crops like maize,



sunflower, turdal etc., which can survive with little managed irrigation is preferred and made significant improvement of these crops in the recent past in the state.

### Research Gap

Considerable studies on Sunflower production have been carried out the growth, but few studies exist on Sunflower but this study hence to price and cost on Sunflower production and Area, production of Sunflower crop.

### Scope of the Study

This study has been done by period of 2017 to 2018 and regionally this study mainly focuses only Karnataka state as district level Area, Production, cost of Sunflower production and price on selected boundaries and understanding the Sunflower situation in Karnataka.

### OBJECTIVES

- To analyze the cost structure, profit of Sunflower production in Karnataka.
- To analysis the trends and patterns in Sunflower production.

### LIMITATIONS

This study based on secondary data source year of 2017 to 2018. This study focuses on the Cost and price of Sunflower Production in Karnataka only. In this topic we ignored other Crops studied only about a particular Crop.

**Table 1: Descriptive statics of Sunflower production**

Area	Maximum	Sum	Mean	Std. Dev	C.V
1998-99	163016	833346	34722.75	47004.58	1.35
1999-00	79849	494099	20587.46	24276.03	1.18
2000-01	92216	477791	19907.96	28341.87	1.42
2001-02	163537	584318	24346.58	38903.54	1.60
2002-03	199430	876592	36524.67	52525.47	1.44
2003-04	265364	1135464	49368.00	69556.63	1.41
2004-05	307674	1271128	52963.67	78626.95	1.48
2005-06	342951	1427435	57097.40	86584.18	1.52
2006-07	247090	1230569	49222.76	68070.95	1.38
2007-08	192786	1025175	39429.81	52720.54	1.34
2008-09	162826	1001015	40040.60	50509.12	1.26
2009-10	132138	794165	31766.60	41350.04	1.30
2010-11	59598	409253	15157.52	18417.57	1.22
2011-12	60151	381267	14664.12	18906.12	1.29
2012-13	74181	510078	18891.78	24664.88	1.31
2013-14	63376	416705	16668.20	22155.46	1.33
2014-15	58960	355901	13688.50	18460.70	1.35
2015-16	49051	330323	12704.73	16477.98	1.30
2016-17	34832	220357	8814.28	12036.95	1.37
2017-18	34009	173098	6923.92	10460.35	1.51
2018-19	39917	144614	5784.56	9765.13	1.69
2019-20	24899	135592	5021.93	7437.44	1.48

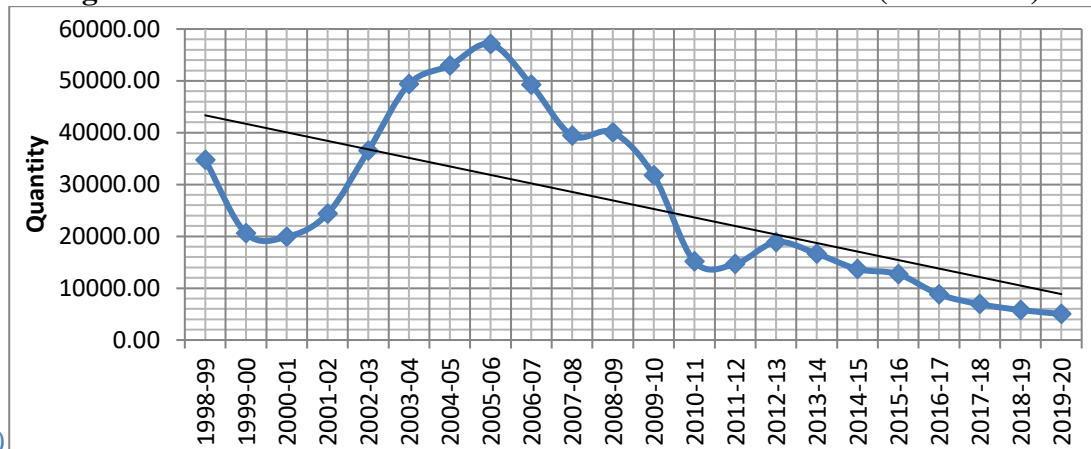
Source: [www.Des.kar.in](http://www.Des.kar.in) & [www.icrisat.org](http://www.icrisat.org)

### Area of sunflower crop:

The table 1 Descriptive statistics of Sunflower production shows that and area of sunflower in Karnataka. The maximum production of sunflower produced in the year of 2005-2006(i.e. 3, 42,951)

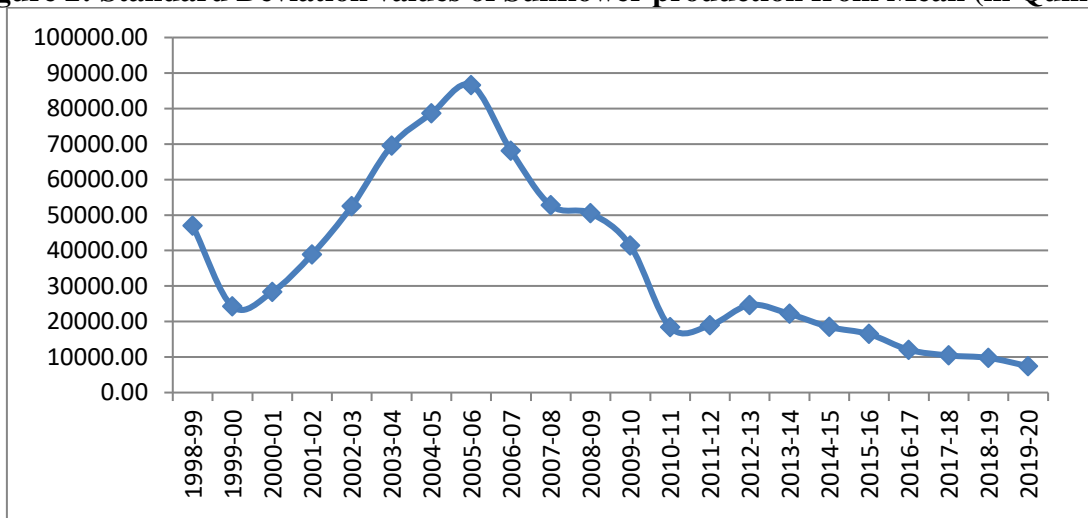
khaf season. The minimum area is that 62 acres over a period of 22 years. It has high standard deviation compare to mean value. And positive skewed over a period of 22 years.

**Figure 1: Mean Area of Sunflower cultivation in Karnataka (in Hectare)**



The above Figure 1 shows that Trends and Pattern in Karnataka. District wise Sunflower productions during the year of 1998 to 2020 (22 years) .This table also have some Descriptive statics. In the year of 2005-06 highest area is cultivated Sunflower in Karnataka (i.e. 57094.40) hectare. And low mean value of area was cultivated in the year of 2019-20 (5021.93) hectare.

**Figure 2: Standard Deviation values of Sunflower production from Mean (in Quintal)**



Above the Figure 2 shows the Trends and Pattern in Karnataka. District wise Sunflower productions during the year of 1998 to 2020 (22 years) .This table also have some Descriptive statics. In the year of 2005-06 highest area is cultivated Sunflower in Karnataka (i. e 86584.18) hectare. And Slandered Deviation value of area was cultivated in the year of 2019-20 (7437.44) hectare.

**Table 2: Profit rate of Sunflower crop across the State in 2017 (in Rs)**

District	Arr(kg)	Mp(kg)	Revenue	/Acre cost	Profit Margin	Total Cost	Profit
Davanagere	279800	344.67	7945067	403.2	-58.530	9401280	-1456213
Dharwad	60200	78.21	1615426	188.64	-110.430	3785376	-2169950
Chikkamagaluru	298500	174.24	6941452	276.51	-102.270	8284077	-2848505
Chitradurga	717400	588.82	19933523	701	-112.180	25144870	-5211347
Gadag	1112050	1339.74	31406510	2312.4	-972.660	547128600	-233063495



Hassan	733300	380.39	21364718	531.83	-151.440	29999303	-8634585
Kalaburagi	195100	70.9	4771994	74.58	-3.680	4850186	-78192
Koppal	756100	974.27	22921570	1154.34	-180.070	26448378	-3526808
Mysuru	70600	248.35	2238809	289.12	-40.770	2551484	-312675
Raichur	6734500	1074.4 3	20135331 0	1404	-329.570	262645500	-61292190
Tumakuru	21000	60.67	611670	125.24	-64.570	1315020	-703350
Vijayapura	698900	239.75	20582930	251.6	-11.850	21980405	-1397475
Yadgir	1297100	114.37	30292015	131.35	-16.980	34069563	-3781148
Bidar	36100	266.45	999683	626.2	-35.975	2260582	-1260899
Chickballapur	56400	13.35	752940	26.73	-13.380	1507572	-754632
Chamarajanagar	2565400	237.91	71818082	309.52	-71.610	99255326	-27437244
Bagalakot	942800	700.54	27941892	488.080	8.853	19106411.0 0	8835481.0 0
Ballari	6137400	1889.3	17749274 0	1375.62	7.752	138409561. 00	39083179. 00
Belagavi	7254400	2828.6 4	21080402 5	2051.78	8.416	160082409	50721616
Davanagere	961200	760.88	28505604	540.62	0.925	19589779	8915825
Haveri	1568010 0	6645.7 1	45607956 9	4745.3	11.283	342410261	11366930 8
Kalaburagi	3122400 0	13122. 92	90836293 8	9414.76	9.363	683098954	22526398 4
Shivamogga	6222600 0	26124. 97	18099751 35	18778.9 6	6.077	136339182 8	44658330 7
Vijayapura	1700	32	54400	31.45	0.550	53465	935
Yadgir	1100930 00	46686. 48	32029776 46	33511.0 9	5.640	240854428 7	79443335 9

Source: Author Estimation

### Profit of sunflower crop:

Above the Table 2 shows that In the year of 2017 at Kalburgi district has got low profit. Due to higher crop lose was observed based upon market arrivals data and it was continued in other district Bidar, Chamarajanagara, Chikkaballapur, Chitradurga, Davanagere, Gadaga, Hassan, Vijayapura, Koppala, and Yadagiri, respectively. The highest profit of Sunflower crop was observed in the district Davanagere followed by Shivamogga, Ballari ,Haveri, Bagalakot, Belagavi, Kalburgi, Vijayapura and Yadagiri districts have face positive impact of more than 1 Rupee than the cost of cultivation for each Kg of Sunflower production. This almost districts come under the North Karnataka due to this reason Sunflower needed a lot of Sunshine so that above These district have lot of sunshine , and also have suitable climatical conditions ,so it helps to grow the Sunflower crop. Due to this reason those districts have face positive Impact.

**Table 3: Profit rate of Sunflower crop across the State in 2018 (in Rs)**

District	Arr(kg)	Mp(kg)	Rvenue	/Acre cost	Profit Margin	Total Cost	Profit
Bagalakot	1134700	366.03	40577768	518.43	-12.7	52437771	-24090
Ballari	2446300	911.56	87687236	1284.9	-17.97	113645607	5641170
Belagavi	3581000	1277.59	128265004	1803.33	-15.34	166083378	-39580





Bidar	8135200	2732.01	292058494	3829.51	-11.50	375542280	-39580
Chamarajanagar	18000	31	558000	32.23	-1.23	580140	-315234
Chikkamagaluru	14180500	4952.16	508568734	6949.97	-11.51	655851405	-3748
Chitradurga	31002700	10971.77	1112420190	15357.84	-11.86	1433799467	-215880
Davanagere	45183200	15923.93	1620988924	22307.81	-11.68	2089650872	-21288
Dharwad	106654800	37342.88	3826652836	52306.87	-10.75	4930966444	-556150
Gadag	215343700	75781.88	7723794682	106065.61	-11.01	9953104225	-411104
Hassan	398184400	140020.46	14283856632	196038.13	-11.33	18407521008	-733530
Haveri	825865500	290348.16	29625465390	406539.2	-11.21	38179227167	-187495
Kalaburagi	1648149000	579381.84	59122628886	811230.5	-10.74	76192326386	-40860
Koppal	3300881300	1160339.8	1.1841E+11	1624665.46	-11.43	1.52595E+11	-130760
Mysuru	100	27.05	2705	27.6	-0.55	2760	-869400
Raichur	6601961500	2320804.15	2.36826E+11	3249534.47	-12.66	3.05202E+11	-282060
Tumakuru	12000	35	420000	44.24	-9.24	530880	-1564137
Vijayapura	9902854900	3481206	3.55236E+11	4874271.77	-8.47	4.57798E+11	-9000
Yadgir	22893000000	8047944.34	8.21229E+11	11268416.98	-9.63	1.05833E+12	-4228346
Belagavi	15100	68.3	513950	28.52	19.89	215326	-7757436
Davanagere	510800	361.78	16359477	183.54	15.84	8396564	-16014944
Haveri	110200	36	3967200	35.43	0.57	3904386	-14490
Bagalakot	1131800	759.56	36686154	402.51	13.44	20697514	-32044378
Ballari	2124900	1419.27	68900251	735.56	14.35	38304610	-63805168
Chamarajanagar	3907900	2713.21	126940982	1414.08	12.98	71733726	-127393852
Kalaburagi	7274800	4928.04	236494587	2587.58	8.27	134640236	-223257888
Mysuru	15080600	10320.66	490038551	5401.48	11.73	277965088	-470295836
Shivamogga	30141000	20538.52	979387202	10760.18	9.65	555642124	-932826556

Source: Author Estimation

Profit of sunflower crop: Above the Table 3 shows that In the year of 2018 at Bidar district face less profit due to higher crop lose was observed based upon market arrivals data. And it was continued in



other districts Gadaga, Dharavada, Hasan, Haveri, Kalburgi, Koppala, Mysuru, and Raichuru respectively. The highest profit of sunflower crop was observed in the district Shivamogga followed by Davanagere, Kalburgi and Mysuru, Kalburgi, Chamarajanagara, Ballari, Bagalkota, and Belagavi districts have face positive impact of more than 1 Rupee the cost of cultivation a each kg of Sunflower production. This almost districts come under the North Karnataka due to this reason Sunflower needed a lot of Sunshine so that above the district have lot of sunshine, and also have suitable climatical conditions so it helps to grow the Sunflower crop. Due to this reason those district have face positive Impact.

### FINDINGS

- Since from the year 1998-2020 the highest Area of Production noticed in the year of 2005-2006.
- The production of Sunflower Since 1998-2020 in the year of 2005-2006 the production rate of Sunflower is high. It goes on decreasing in the year of 2017, 2018, 2019, 2020 Due to climatic conditions and pandemic condition of covid .
- The Production of Sunflower Cost in the period of 2017-18 The Dharwada, Bidar, Tumakur, Gadaga, Uttarakannada Districts has highest Average Total Cost per Kg of Sunflower production. Shivamogga District has got least Average Total Cost in the same year as compare to other Districts. In the year of 2018- 19 Bidar and Dharawada districts as Highest Average Total Cost. And Shivamogga District has a least Average Total Cost.
- In the year of 2017-18 november at Kalburgi, Followed by Bidar, chamarajanagara, Chikkaballapure, Chitradurga, Davanagera Gadaga, Hassan , Koppala and Yadagiri Districts got Low profit Due to the loss of yield. The highest profit of Sunflower Crop was observed in the district Davanagere followed by Shivamogga, Ballari, Haveri, Bagalakot Belagavi and Yadagiri districts had Faced positive impact of more than
- In the year of 2018- 2019 December Bidar district face less profit due to High Crop loss was observed .It was continued in other District Gadaga, Dharawada, Hassan , Haveri, Kalburgi Koppala, Mysuru, And Riachuru respectively. The Highest Profit of Sunflower Crop was Observed in the district Shivamogga, followed By Davanagere , Kalburgi and Mysuru District had faced positive impact .

### SUGGESTIONS:

- There are few cold storages in Karnataka
- The government has to build large quantities of cold storage for to store their crops for a longer period.
- Money is needed to store sunflower crop.
- Sunflower growers are facing financial problem therefore government should provide the proper financial facilities through Local Financial Institutions.
- Loan facility for farmers.
- Banks should provide loans to farmers to solve their problems.
- To provide Good price for sunflower crop.
- The government should fix the market maximum prices for crops
- To facilitate chemical fertilizer to famers.
- The government should provide incentives ,subsidies and distribute free chemical fertilizer to farmers to help them to grow their crops.

### Conclusion:

Sunflower is the major Oil seed crop. And it consists of 70 different varieties in the world. In the world Ukraine ( 27 %) the largest Sunflower producer and next to it is Russia(24%) Stands second position in the world. In India Karnataka (47%) has got the first position in Sunflower Production



followed by States like Andhra Pradesh, Maharashtra, Bihar, Orissa and Tamil Nadu. In Karnataka Raichuru, Bijapur, Ballari, Bidar, Chitradurga, Belagavi, Gadaga, and Gulbarga has got major Sunflower production. And also Sunflower has a lot of health benefits. Sunflower seeds are a source of many vitamins and can support our immunity system. While Sunflower seeds are healthy, though rich in nutrients, Sunflower seeds are relatively high calories. This topic mainly focuses on cost and price of Sunflower in Karnataka State. In this study there are many findings that we are discussed as above. Here we considered the cost and price of Sunflower during the period of 2017-2018. The production Sunflower cost in the period of 2017-18. The Dharwad, Bidar, Tumakuru, Gadaga, Uttarakannada District has highest Average Total Cost per Kg of Sunflower production. Shivamogga, Ballari, Haveri, Belgam has got least Average Total Cost. 2018-19 Bidar, Dharwad, Gadaga, and Koppala District has got highest Average Total cost. And Shivamogga, Myuru and Davanagere Districts has least Average Total Cost. 2017-18 especially in November month at Kalburgi followed by Bidar, Chamarajanagara, Chikkaballapura, Chitradurga, Davanagere, Hassan, Koppala, and Yadagiri has got low profit due to loss of yield, and also due to the climatic condition. The highest profit of Sunflower crop was observed in the district like Davanagere, Shivamogga, Ballari, Haveri, Bagalkot, Belagavi and Yadagiri has got more profit. 2018-19 especially in December district face less profit due to high crop loss was observed it was continued in other districts too such as Gadaga, Dharwad, Hassan, Haveri, Kalburgi, Koppala, Mysuru, and Raichuru respectively. The highest profit of Sunflower crop was observed in the district like followed by Davanagere, Kalburgi and Mysuru district has got highest profit. From this study we can notice that 2017-18 and 2018-19 Dharwad, Bidar, Tumakuru, Gadaga, Uttarakannada and Koppala district has got highest Average total cost and Shivamogga, Myuru and Davanagere, Ballari, Haveri, and Belgam district has got least Average Total Cost.

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