Helia 2025, Vol. 48 (83), 154-171
https://doi.org/10.29329/helia.2025.1411.7
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Original article

The Effects of Price and Support Policies on Sunflower Production in Turkey on the Welfare of Producers

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Abstract

This study provides an overall assessment of producer welfare in terms of price and agricultural support policies for sunflower production, which is important for the Turkish economy and agriculture. Oilseed crops are among the strategic products with a supply gap in Turkey's agricultural production. While the current sunflower price for 2001-2025 increased by 145% between 2022 and 2025 in particular, an increase of 450% was achieved in area-based support. When the product price is adjusted according to the Producer Price Index (PPI) based on 2003, the unit price fell from 0.88 TL/da in 2020 to 0.52 TL/da in 2024. In terms of subsidies, it has been calculated that a sunflower producer receiving 696.50 TL in subsidies at current prices in 2024 will receive 20.03 TL in real terms and 20.40 USD in dollar terms. This figure is expected to be 732 TL/da at current prices, 17.11 TL/da in real terms, and 18.79 USD/da in dollar terms under the new support model to be implemented as of 2025. In Turkey, a sunflower producer received total support amounting to 41% of their total income per decare in 2006, whereas this figure has declined to 12% in 2025. It is crucial to develop pricing and support policies that will reduce Turkey's dependence on imports in sunflower agriculture.

Keywords: Agriculture, Sunflower, Agricultural Subsidies

Received: 28 November 2025 * **Accepted:** 23 December 2025 * **DOI:** https://doi.org/10.29329/helia.2025.1411.7

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INTRODUCTION

Agriculture is considered a strategic sector from an economic and social perspective due to its multifunctional nature and its role in food security, rural development, income generation and environmental objectives (Bayramoğlu et al., 2014).

As the agricultural sector is dependent on natural, human and biological factors, it presents a higher risk of lower income compared to the industrial and service sectors. Instability in agricultural product markets, slow return on investment capital, inelastic demand for agricultural products, and difficulties in product storage and delivery to consumers negatively affect investment in the sector (Topçu, 2008; Badem and Hurma, 2021).

Agriculture retains its strategic importance in social and economic terms in Turkey, as it does in developing and, in particular, emerging countries. In recent years, agriculture has played a critical role in issues such as food security, rural development, foreign trade, and employment. It is also a source of livelihood for those engaged in the sector while meeting the food needs of all living beings (Sağdıç and Çakmak, 2021)

Due to its inherent dependence on nature, agriculture involves risks and uncertainties. For this reason, safeguarding food security, ensuring economic, social and environmental sustainability in agriculture, and improving the welfare of those working in the sector are among the fundamental objectives of public policy (Özüdoğru et al., 2015).

Oilseed crops, which are part of the plant production group in Turkey, are considered a staple foodstuff of vital importance in human nutrition (Kaya et al., 2010). Sunflower ranks fourth after maize, wheat and rice in terms of global cultivation, and the reason for cultivating large areas with this product stems from its versatile uses (Stoicea et al., 2022). Among the oilseed crops cultivated in Turkey are sunflower, canola, soybean, sesame, and poppy (Onat et al., 2017; Kadakoğlu and Yılmaz, 2022). Sunflower ranks first among these oilseed crops in terms of cultivation area, production volume, and consumption rate, which stands at 70% (Özüdoğru et al., 2015; Semerci and Yurt, 2025; Gül et al., 2017).

Turkey produces 2 million tonnes of sunflower seeds, accounting for approximately 3.6% of global sunflower seed production. Despite this production potential, Turkey has experienced difficulties in meeting the demand for vegetable oil in recent years due to population growth and changes in consumption habits (Kaya, 2016). The self-sufficiency rate, which was 51% in 2023, is projected to rise to 71.9% in 2024 (TÜİK, 2025). Therefore, Turkey is a net importer of oilseed crops, with imports of oilseed crops and their derivatives amounting to approximately 3.5-4 billion dollars (Semerci, 2019; Kadakoğlu and Karlı, 2019; Semerci and Durmuş, 2021).

The aforementioned structural characteristics of agriculture and the strategic nature of agricultural products necessitate their support. Government support policies aim to ensure the continuity and direction of production, increase quality and productivity, and enhance product diversity for alternative products (Yavuz, 2005; Gaytancıoğlu, 2009).

For a country, ensuring food security, increasing the income levels of those engaged in agricultural activities, directing production patterns, making effective use of natural resources, ensuring rural development, and achieving quality and productivity increases to ensure sustainability in agriculture are among the fundamental objectives of agricultural support policies (Yıldız, 2017; Demirdöğen, 2018; Arslan and Solak, 2019).

The aim of this study is to empirically analyse the effects of price and support policies applied in sunflower production in Turkey on the welfare of producers. Analysing the effects of price policies and support mechanisms in sunflower production on producer welfare is important for several reasons. These include food security and strategic dependence, rural development and social justice, financial sustainability and efficiency.

Materials and Methods

The data pertaining to the main material of the study were obtained from data obtained from the Ministry of Agriculture and Forestry, the Turkish Statistical Institute (TÜİK, 2025), the Central Bank of the Republic of Turkey (TCMB, 2025), and the Food and Agriculture Organisation of the United Nations (FAO, 2025). Data obtained from relevant sector reports and articles published in this field were also utilised. Time series were used for a detailed assessment of the price and agricultural support data applied to sunflowers. The study analysed the agricultural support measures implemented by the Ministry of Agriculture and Forestry from 2001 to 2025. The effects of support policies on producers were evaluated, taking into account the changes and fluctuations in these data.

Sunflower data regarding production volume, cultivation area, and yield values have been interpreted through index calculations. In this context, sunflower prices, area-based subsidies and premium-based subsidies between 2001 and 2025 were adjusted for inflation using the Producer Price Index (PPI) with 2003 as the base year to enable a more effective analysis. In addition, data from the Central Bank of the Republic of Turkey (CBRT) was utilised to make the analysis more detailed. To realign unit prices and support amounts in sunflower farming,

The Real Sunflower Price for the Relevant Year = (Current price for the relevant year / CPI value for the relevant year) * 100

The Real Support Amount for the Relevant Year = (Current support amount for the relevant year / CPI value for the relevant year) * 100 these formulas have been utilised.

Sunflower in the World and Turkey

Worldwide, as of 2024, sunflower has a strategic importance for humanity, with a cultivation area of 27,607,000 hectares and a production volume of 54,829,000 tonnes. Russia accounts for 33% of global sunflower cultivation areas with 93 million decares, followed by Ukraine with 62 million decares and a 22.3% share. Turkey, on the other hand, has an 8.5 million decare share in global sunflower cultivation, representing 2.48% of the total. While the global average yield for sunflowers is 199 kg/da, the average for Turkey is calculated as 260 kg/da (Bozer, 2024).

In 2004, sunflower seed production in Turkey, with a cultivation area of 4.8 million decares, yielded 167 kg/da, resulting in a production of 800,000 tonnes. Turkey reached its highest cultivation area in 2022 with 9 million decares. Similarly, the highest production volume was also achieved in 2022, reaching 2.4 million tonnes. Looking at yield increases, the yield threshold of 160-190 kg/da up to 2008 was exceeded after 2008, rising above 200 kg/da. In addition to technological developments, this increase in yield can be attributed to the commencement of production in the irrigated areas of Anatolia where sunflower cultivation takes place (Table 1).

Table 1: Sunflower Planting Area, Production Volume, Yield and Indices in Turkey

Years	Cultivated Area	Production	Yield	Cultivated Area Index	Production Volume Index	Yield Index
2004	4.800.000	800.000	167	100,0	100,0	100,0
2005	4.900.000	865.000	177	102,1	108,1	105,9
2006	5.100.000	1.010.000	198	106,3	126,3	118,8
2007	4.857.000	770.000	159	101,2	96,3	95,1
2008	5.100.000	900.387	177	106,3	112,5	105,9
2008	5.150.000	960.300	186	107,3	120,0	111,9
2010	5.514.000	1.170.000	212	114,9	146,3	127,3
2011	5.560.000	1.170.000	210	115,8	146,3	126,3
2012	5.046.160	1.200.000	238	105,1	150,0	142,7
2013	5.202.600	1.380.000	265	108,4	172,5	159,2
2014	5.524.651	1.480.000	268	115,1	185,0	160,7
2015	5.689.950	1.500.000	264	118,5	187,5	158,2
2016	6.167.800	1.500.000	243	128,5	187,5	145,9
2017	6.813.976	1.800.000	264	142,0	225,0	158,5
2018	6.489.344	1.800.000	277	135,2	225,0	166,4
2019	6.759.834	1.950.000	288	140,8	243,8	173,1
2020	6.508.696	1.900.000	292	135,6	237,5	175,2
2021	8.113.116	2.215.000	273	169,0	276,9	163,8
2022	9.005.177	2.350.000	261	187,6	293,8	156,6
2023	8.646.679	1.960.000	227	180,1	245,0	136,2
2024	8.549.239	1.855.000	217	178,1	231,9	130,2

Source: Created by the author using data from TÜİK (2025) and FAO (2025).

The Course of Agricultural Support Policies Implemented in Turkey

National agricultural policies are based on increasing the level of prosperity in agriculture by taking into account domestic and foreign demand in agricultural production, enhancing food security and safety, protecting the country's biological and natural resources, increasing productivity, and ensuring rural development (Acar and Bulut, 2009; Kıymaz, 2021).

However, while the agricultural sector is an area that requires support, it is necessary to ensure that this support is maintained at an optimal level and implemented in a way that imposes the least financial burden on the state (Doğan, 2018; Hiç, 2020; Oğul, 2022).

The agricultural support policies implemented until the 2000s have undergone a radical transformation process due to the burden they placed on the budget, significant disconnections from market conditions, adverse effects arising from agreements entered into, and the prominence of political considerations in support prices (Narin, 2008; Erdal and Erdal, 2008).

The reasons for these changes in agricultural policies include both internal and external factors. External reasons include the EU accession process and agreements made with international organisations such as the World Trade Organisation and the International Monetary Fund. Problems arising in the agricultural and macroeconomic structure, problems experienced in rural areas, and environmental and climate issues, which have become increasingly important in recent years, are among the internal reasons (Şahinöz, 2010; Kalabak and Aslan, 2020; Ataseven, 2016; Bayramoğlu et al., 2014; Karaköy and Özkan, 2018).

As stated by Demirdöğen et al. (2016), the agricultural subsidies currently in place were initiated in 2000 under the Agricultural Reform Implementation Project (TRUP), which introduced the Direct Income Support (DGD) scheme based on the size of farmers' land holdings. This process continued until 2006, subject to certain adverse developments. The agricultural support payments were shaped in terms of amount and type with the implementation of Agricultural Law No. 5488 in 2006. This process will continue until the new support model was implemented in 2025-2026.

Agricultural support instruments in place between 2001 and 2025 include area-based agricultural support payments, differential support payments, livestock support payments, compensatory payments, agricultural support for rural development, agricultural insurance services, and other agricultural support. Among these agricultural support instruments, area-based support, premium-based support and livestock support accounted for 75.6 per cent of the total (Ataş et al., 2023). Agricultural insurance services have also increased in recent years, reaching 20 billion TL and a 14.8% share (Table 1).

Although there are many and varied agricultural support instruments in place for the period 2001-2025, the types of support available to sunflower producers fall into two main categories (TOB,

2025). These are fuel subsidies, which account for 61.7 per cent of area-based support, and fertiliser subsidies, which account for 23.3 per cent. The other important support group is premium payments under the name of differential payment support. The main purpose of differential payment support is to create a balance between domestic and international prices for specified products. The fundamental purpose of differential payment support is to encourage production of products with a supply shortage (Agricultural Law No. 5488). This support group, paid for products with a supply shortage, accounts for 16.3% of the total support. Within the total support provided, cereal and legume premium payments have the highest share at 24.1% (Table 2).

Table 2. Distribution of Turkey's Agricultural Support Budget 2023-2025

SUPPORT ISSUE	Support Budget (Current Prices in Million TL)			Share in Support Budget		
	2023	2024	2025	2023	2024	2025
1-Area-Based Agricultural Support Payments	18.456,8	23.720,1	32.521,6	29,1	25,9	24,1
Area-Based Additional Payment	342,0	503,4	910,0	0,5	0,5	0,7
Diesel	11.318,7	16.057,0	20.077,0	17,9	17,5	14,9
Fertiliser	4.638,9	4.965,0	8.281,0	7,3	5,4	6,1
Use of Certified Seeds and Saplings	1.311,1	1.334,7	2.352,6	2,1	1,5	1,7
Hazelnuts	846,0	860,0	901,0	1,3	0,9	0,7
2-Compensatory Payments	1320,5	2.097,7	2.076,00	2,1	2,2	1,5
Plant Quarantine Compensation	15,8	14,1	0,0	0,0	0,0	0,0
Potato Blight Support	0,0	0,0	28,0	0,0	0,0	0,0
Tea Pruning Expenses and Compensation	1.304,7	2.015,6	2048,0	2,1	2,2	1,5
3-Difference Payment Supports	8.042,4	24.896,2	42.327,0	12,7	27,2	31,4
Cereals and Pulses	2.076,7	18.425,2	32.489,2	3,3	20,1	24,1
Tea	379,5	435,0	2.500,0	0,6	0,5	1,9
Products with Supply Shortages	5.586,2	6.036,0	7.337,8	8,8	6,6	5,4
4-Livestock Support Payments	15.503,5	19.739,0	27.150,5	24,2	21,6	20,1
5-Agricultural Support for Rural Development	4.867,9	7.829,0	10.200,0	7,7	8,6	7,6
6-Agricultural Insurance Support Services	9.477,9	12.750,0	20.000,0	15,0	13,9	14,8
7-Other Agricultural Support	5.854,9	584,7	724,9	9,2	0,6	0,5
TOTAL	63.325,7	91.549,5	135.000,0	100,0	100,0	100,0

Source: The author has compiled Ministry of Agriculture and Forestry data.

The Ministry of Agriculture and Forestry's decision regarding changes to support for plant production and other support measures to be implemented between 2025 and 2027 was published in the Official Gazette on 14 September 2025, following a Presidential decree, and has now come into effect. In accordance with this decision, the most significant changes in crop production support have been grouped under the headings of basic support, planned production support, water restriction support, and production development support. The Presidential Decree announced a basic support coefficient of 244 TL per decare as of 2025. The support amount for 2025 will be calculated by

multiplying the announced support coefficient by the announced rates. For sunflowers, this rate has been set at 1.5 for basic support and 1.5 for planned production support. The support amount that sunflower producers will receive for their 2025 production has been calculated as 732 TL. In addition, this rate has been set at 1.2 for water restriction support (TOB, 2025).

Determining the Effects of State Agricultural Subsidies on Sunflowers:

Nominal and Real Prices of Sunflowers

The effects of agricultural subsidies were determined based on the base price of sunflower seeds. Current and real prices for the years 2001-2025 are shown in Figure 1. According to this, prices, which were 26 krş/kg in 2011, reached 29 TL/kg in 2025. It is observed that the period with the highest change in nominal prices is between 2020 and 2025. Prices, which were 4.39 TL/kg in 2020, reached 29 TL/kg in 2025. However, when measuring the contribution to producers' welfare, monitoring changes in real prices rather than nominal prices will provide more effective and reliable data.

In this context, nominal sunflower prices were adjusted for inflation using the producer price index, with 2003 as the base year. When prices are assessed in real terms, a decline was observed from 2001 to 2010, while real prices entered an upward trend between 2010 and 2020. However, between 2020 and 2025, the change in real prices reached -22.2%. This decline in purchasing power indicates that the increase in inflation rates was higher than the real price of the product. Therefore, despite a 560% increase in nominal prices between 2020 and 2025, real prices show a 22% decline in farmer welfare. The real price of sunflower seeds, which was 0.79 in 2003, has declined to 0.72 in 2025 (Figure 1).

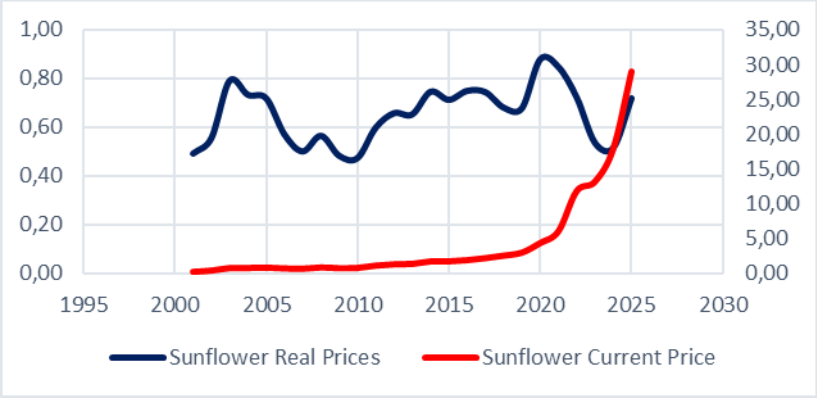

Figure 1. Current and real prices of sunflower oil in Turkey, 2001–2025

Source: Nominal prices from Turkish Statistical Institute data and real prices calculated by the author.

Sunflower Area-Based Supports (Fuel Oil and Fertiliser Support):

Diesel fuel subsidy, which accounts for a significant 21% share of total subsidies in Turkey, constitutes 87% of area-based subsidies. Diesel fuel subsidy for oilseeds is shown in Figure 2 with nominal and real prices. Among area-based subsidies, diesel fuel subsidies in particular started at 3.90 TL/da in 2003 and reached 144 TL/da in 2025. Fertiliser support, on the other hand, was paid at a nominal value of 3 TL/da in 2004, and this figure increased by 196% to 62 TL/da in 2025. The most radical increase in nominal prices was a significant 456% increase between 2020 and 2025, depending on economic conditions. When evaluating diesel fuel and fertiliser subsidies in real terms, they declined to 4.27 TL/da in 2016 and stood at 5.14 TL/da in 2021. Between 2003 and 2021, diesel fuel and fertiliser subsidies generally followed a flat trajectory (Figure 2).

When assessed on a real basis, a 12% loss in diesel fertiliser subsidies between 2022 and 2025 indicates a decline in farmer welfare. In the long term, real prices and diesel fuel subsidies show a 15.8% decline in producer welfare between 2008 and 2024 (Figure 2).

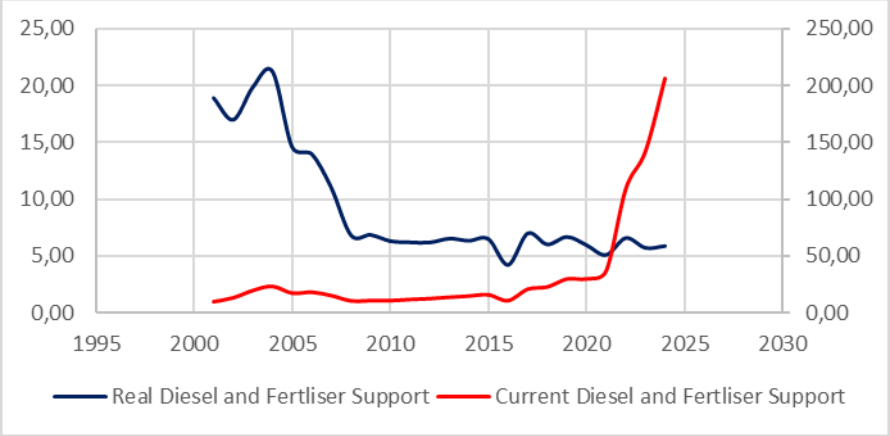

Figure 2. Current and Real Prices of Diesel Fertiliser Subsidies for Oilseeds in Turkey

Source: Nominal prices from Ministry of Agriculture and Forestry data and real prices calculated by the author

Sunflower Premium Support Payments:

Premium support payments for sunflowers in Turkey, calculated using nominal and real prices, are shown in Figure 3. The application, which began in 2004 at 14 kuruş/kg, particularly for products with a supply shortage, reached 50 kuruş/kg in 2022. In 2023, premium payments on a nominal basis increased by 100%, rising to 1 TL/kg. As a result of inflationary pressure in the country, this figure increased by 225% in 2024, reaching 2.25 TL/kg. To see the effects of the nominal change in sunflower subsidies more clearly, the 2003 PPI index was used to convert the figures to real values. In nominal subsidy payments, as of 2022, there has been a radical increase of 275 per cent, reaching 490.50 TL/kg from 130.50 TL/kg. However, when these figures are analysed in real terms, it can be

seen that there was a real loss of 168.5 per cent in producer welfare (purchasing power) between 2016 and 2024. The reason for the losses experienced in real terms can be explained by price increases in nominal terms remaining below inflation rates and yield losses due to climate change (Figure 3).

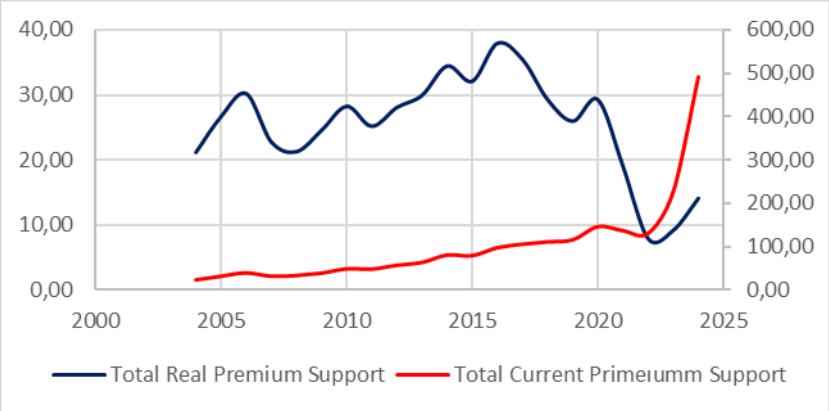

Figure 3. Nominal and Real Prices of Premium Supports for Oilseeds in Turkey

Source: Nominal prices from Ministry of Agriculture and Forestry data and real prices calculated by the author

Total Support and Total Return Ratio Analysis for Sunflower:

Producers' annual income per decare was calculated by multiplying the yield obtained from sunflower production in Turkey by the unit price for each year. Total support amounts were calculated taking into account the area-based and premium-based support policies applied between 2011 and 2025. The ratios indicated by dividing total support by total yield were calculated on an annual basis.

The calculation shows that the highest ratio of total support to total return was achieved in 2006 at 41%, while the lowest ratio was 0.7% in 2022. Total income rose from 3,908.74 TL to 6,322.0 TL in 2024-2025, showing a nominal increase of 61.7%, while agricultural subsidies rose from 593 TL to 732 TL, showing an increase of 23.4%. However, calculations based on the data results show a 241.6% decrease in producers' welfare shares. This result must be interpreted in two ways. It must be evaluated in relation to the increase in producer income and the increase in subsidies. Although the increase in current income is high in nominal terms, in real terms, the 2003 yield and the 2025 yield are seen to be close in value at 112.39 TL/da.

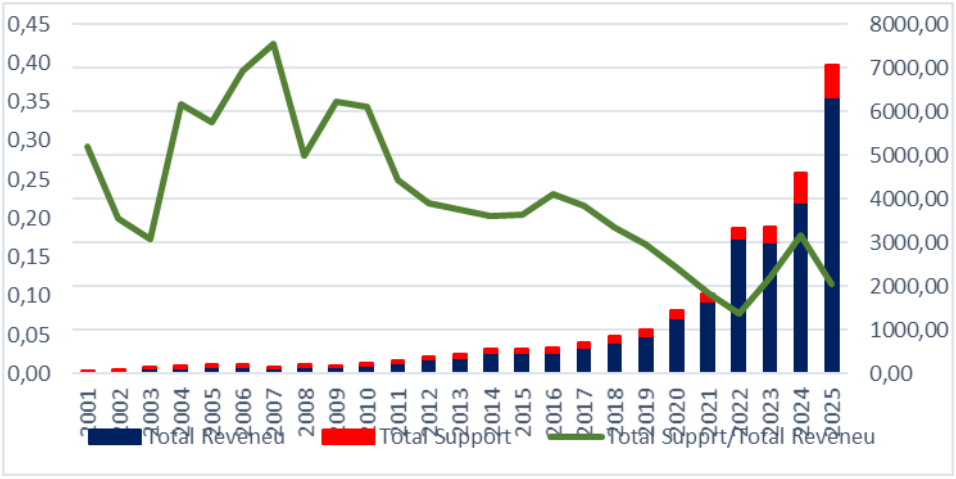

Figure 4. Total Revenue, Total Support Amount and Total Support to Total Revenue Ratio in Sunflower Production

Source: Ministry of Agriculture and Forestry data, created by the author using Turkey Statistical Institute data

Despite the decline in yields that began in 2020, there was a significant increase of 393.18% in the total current yield between 2020 and 2025. In terms of revealing producer welfare, total income was obtained by multiplying the current price of sunflower by the average sunflower yield in Turkey. Again, area-based subsidies (fuel-fertiliser) and the premium subsidy obtained based on yield were added together to calculate the subsidies obtained per unit area (Figure 4).

Based on these data, the ratio of total subsidies to total income has been calculated. Yield, one of the most important determinants of total income, was 292 kg/da in 2020 but fell to 218 kg/da in 2024 due to climate change. However, the limited increase in subsidies resulting from the rise in total income due to the increase in current sunflower prices has led to a 15% decline in the total subsidy/total income ratio (Table 3).

As of 2025, new agricultural support policy instruments, including basic support, planned production support, water restriction support and production development support, have been implemented. Under the new support model, sunflower producers will receive support of 732 TL/da in 2026 for the product they produce in 2025 (Table 3).

Table 3. Sunflower Price, Yield, Total Support and Total Income Ratio for the Years 2001-2025

Years	Sunflower Price (TL)	Yield	Total Income (TL)	Total Support (TL)	Total Support/ Total Revenue
2001	0,26	134	34,84	10,00	0,29
2002	0,44	160	70,40	13,50	0,19
2003	0,79	151	119,29	19,90	0,17
2004	0,81	167	135,27	49,26	0,36
2005	0,86	177	152,22	52,24	0,34
2006	0,75	198	148,50	61,40	0,41
2007	0,70	159	111,30	39,60	0,36
2008	0,89	177	157,53	46,33	0,29
2009	0,77	186	143,22	49,43	0,35
2010	0,82	212	173,84	54,70	0,31
2011	1,15	210	241,50	57,08	0,24
2012	1,34	238	318,92	54,94	0,17
2013	1,39	265	368,35	68,96	0,19
2014	1,75	269	470,75	84,00	0,18
2015	1,76	264	464,64	78,55	0,17
2016	1,93	244	470,92	91,00	0,19
2017	2,22	264	586,08	115,00	0,20
2018	2,58	277	714,66	117,00	0,16
2019	3,02	289	872,78	130,40	0,15
2020	4,39	292	1281,88	154,00	0,12
2021	6,09	273	1662,57	157,00	0,09
2022	11,86	261	3095,46	207,00	0,07
2023	13,21	227	2998,67	257,00	0,09
2024	17,93	218	3908,74	593,00	0,15
2025	29,00	218	6322,00	732,00	0,12

Source: Prepared by the author using data from the Ministry of Agriculture and Forestry and the Turkish Statistical Institute (TÜİK, 2025).

The determinants of the income obtained by sunflower producers per unit area are yield and unit price. In addition to this income, the total amount of agricultural subsidies paid by the state can be considered as two fundamental factors that increase the economic welfare level of producers. The share of agricultural subsidies received by producers in their total income is significant. This ratio rose to 41% in 2006. A relative downward trend can be observed from 2006 to 2022. The lowest ratio was 7% in 2022. This ratio, which showed an increase in 2023-2024, fell back to 12% with the 2025 support model (Table 3).

Table 4. Area-Based and Premium-Based Supports, Total Current, Total Real and Total Dollar-Based Supports

Years	Diesel Fuel Support(TL)	Fertiliser Support (TL)	DGD (decare TL)	Diesel Fuel and Fertiliser Support(TL)	Premium(TL)	Total Premium Support(TL)	Total Support(TL)	Total Real Support (TL)	Total Support USD
2001	0,00	0,00	10,00	10,00	0,00	0,00	10,00	18,94	7,14
2002	0,00	0,00	13,50	13,50	0,00	0,00	13,50	17,03	9,00
2003	3,90	0,00	16,00	19,90	0,00	0,00	19,90	19,90	14,19
2004	4,50	3,00	16,00	23,50	0,14	23,38	46,88	42,39	32,29
2005	4,50	3,00	10,00	17,50	0,18	31,86	49,36	41,24	36,75
2006	5,40	3,00	10,00	18,40	0,20	39,60	58,00	44,15	39,59
2007	5,40	3,00	7,00	15,40	0,20	31,80	47,20	33,79	35,49
2008	5,40	5,40	0,00	10,80	0,19	33,45	44,25	28,11	36,15
2009	5,50	5,50	0,00	11,00	0,21	39,06	50,06	31,41	32,68
2010	5,50	5,50	0,00	11,00	0,23	48,76	59,76	34,55	36,55
2011	6,00	6,00	0,00	12,00	0,23	48,30	60,30	31,39	38,19
2012	6,40	6,30	0,00	12,70	0,24	57,12	69,82	34,26	37,97
2013	7,00	7,00	0,00	14,00	0,24	63,60	77,60	36,44	41,08
2014	7,50	7,50	0,00	15,00	0,30	80,70	95,70	40,76	45,72
2015	7,90	8,25	0,00	16,15	0,30	79,20	95,35	38,57	34,75
2016	11,00	0,00	0,00	11,00	0,40	97,60	108,60	42,12	37,28
2017	17,00	4,00	0,00	21,00	0,40	105,60	126,60	42,40	35,78
2018	19,00	4,00	0,00	23,00	0,40	110,80	133,80	35,28	28,98
2019	26,00	4,00	0,00	30,00	0,40	115,60	145,60	32,66	26,09
2020	26,00	4,00	0,00	30,00	0,50	146,00	176,00	35,19	23,89
2021	29,00	8,00	0,00	37,00	0,50	136,50	173,50	24,11	19,56
2022	88,00	21,00	0,00	109,00	0,50	130,50	239,50	14,57	13,33
2023	121,00	21,00	0,00	142,00	1,00	227,00	369,00	14,97	13,63
2024	144,00	62,00	0,00	206,00	2,25	490,50	696,50	20,03	20,40
2025	0,00	0,00	0,00	0,00	0,00	0,00	732,00	17,11	18,79
2026	0,00	0,00	0,00	0,00	0,00	0,00	930,00	18,06	16,19

Source: Prepared by the author using data from the Ministry of Agriculture and Forestry, the Central Bank of the Republic of Turkey, and the Turkish Statistical Institute.

Between 2001 and 2024, diesel fuel subsidies, which accounted for a significant share of area-based support for sunflower production, increased 38 times over the years, reaching 144 TL/da at current prices. The second most important type of support for sunflowers, premium support, increased 21 times, rising to 490.5 TL/da. The total current support increased 70 times, reaching 696.5 TL/da. However, it was determined that there was no increase in the real and dollar-based values of these figures, and that there was a decline. Under the new support model, this loss is seen to have declined both in real and dollar terms. Based on these results, it has been determined that producers' economic welfare levels have been negatively affected. The year in which agricultural support was highest in

dollar terms was 2014, reaching 45.72 USD/da, while the highest value in real terms was calculated as 44.15 TL/da in 2006.

The analysis of the 2001-2024 period shows that Turkey's sunflower support policies can be divided into three distinct phases. The first phase (2001-2012) is characterised by relative stability and low support (average 44.08 TL/decare). During this period, real support values stood at 31.4 TL. The second period (2013-2020) is a transition period in which the DGD was eliminated but other support measures continued (average 119.90 TL/decare). The third period (2021-2024) is a period of dramatic increases in nominal support (average 369.25 TL/decare, a 301% increase). However, a striking finding is that real support values fell to 18.42 TL in period 3, indicating that inflation completely eroded the support increases.

As of 2025, under the new support model, the amount of support that sunflower producers will receive, which replaces diesel fuel and fertiliser support and premium support, has been announced as 732 TL/da with basic support and planned production support. However, it has been calculated that sunflower seed producers who are eligible for water restriction support and production development support (support for using domestic seeds) will receive a total support amount of 1,171.2 TL/da.

Analysis of Producer Income in Sunflower Production Using Current, Real and Dollar Prices:

When calculating the total income, which constitutes one aspect of equality in increasing producer welfare, the total income at current prices was obtained by multiplying the yield per unit area by the base price announced for sunflower. The total current income, which was 34.84 TL/da at 2001 current prices, followed a normal trend until 2016, reaching 470.92 TL/da. Between 2017 and 2019, the current yield increased by 48%, rising from 586.08 TL to 872.78 TL. However, during the period of inflationary pressure between 2021 and 2025, the increase rate reached 280% at current prices.

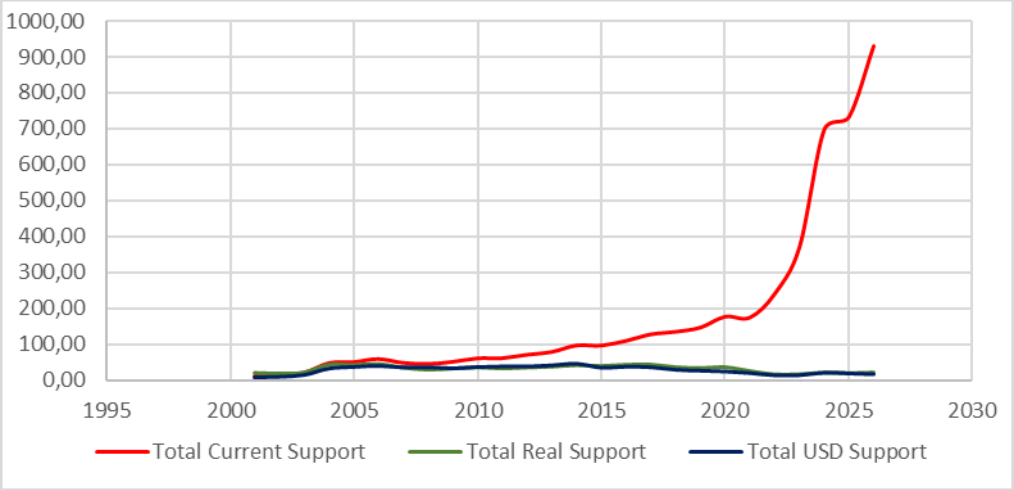

Figure 5. Current, Real and Dollar-Based Yield per Unit Area in Sunflower Farming

Source: Prepared by the author using data from TÜİK (2025), TOB (2025) and TCMB (2025).

As of 2020, real prices reached their highest level at 256.29 TL/da, while this figure is projected to decline to 147.75 TL/da by 2025. The year with the highest dollar-based yield per unit area for sunflower was 2014, at 224.92 USD/da. While the yield per decare in dollar terms and the real yield followed a similar trend, a sharp increase in current prices was observed (Figure 5).

CONCLUSIONS AND RECOMMENDATIONS:

Sunflower, with 27.8 million hectares of cultivated land and a production volume of 54.8 million tonnes worldwide, maintains its position as a strategic product. Sunflower sproduction in Turkey, cultivated on 8.5 million decares of land with a production volume of 2 million tonnes, accounts for 3.6% of global sunflower production. Sunflower oil constitutes 70% of vegetable oils used in Turkey. Turkey covers this shortfall through imports, as its self-sufficiency rate in sunflower production is around 60% (Gül, 2016). As of 2024, Turkey is seen to have paid 2.3 billion USD for imports of sunflower and its derivatives, amounting to 3.4 million tonnes. According to 2024 data (Bozer, 2024) Turkey ranks first in the world in sunflower seed imports.

According to these data, the production of sunflower seeds, which is of strategic importance for Turkey, is of great importance in terms of price and support policies. In this study, the effectiveness of area-based support (fuel and fertiliser support) and premium-based support applied to sunflowers between 2001 and 2024 was determined by calculating their share in total production revenue. It was determined that area-based subsidies accounted for 29% of the agricultural subsidies received per unit area for sunflowers, while premium-based subsidies accounted for 71%. Considering the analyses of these agricultural subsidies applied in sunflower cultivation between 2001 and 2024, the values were adjusted to real and dollar terms. The results of the study show that, despite the yield loss experienced in recent years due to climate change, there has been a rapid increase in producer income in current terms, while a decline has been observed in real and dollar terms. The losses in real and dollar terms appear to have had a negative impact on the economic well-being of producers.

The research findings show that prices have increased 111.5 times over 24 years, with a particularly dramatic increase after 2018. Sunflower yields showed a relative increase from 2001 to 2020, but have shown a gradual decline between 2021 and 2025. Despite this decline in yield, income has increased 181.4 times, reaching 6322 TL/da. The increase in income appears to be entirely due to price increases. Total subsidies per unit area for sunflowers have increased 69.6 times. According to this data, the decline in yield + price increase = points to the existence of an unsustainable model.

Sunflower cultivation in the Thrace region is known to account for 45% of Turkey's cultivation area and 48% of its production in the provinces of Tekirdağ, Edirne and Kırklareli (TÜİK, 2025). These three provinces, which rank among the top producers of sunflowers, have experienced

significant yield losses in recent years due to drought. Due to the significant decline in premium support linked to the drop in yield loss, producer income is also gradually decreasing. Depending on the yield per unit area, a producer in Tekirdağ earns 3.770 TL/da, while a producer in Konya can earn up to 10.070 TL/da. In Thracian agriculture, since sunflower cultivation cannot be replaced with another product, sunflower subsidies must take this situation into account.

Despite the radical increase in current prices, particularly over the last four years, resulting from the pricing and support policies implemented between 2001 and 2024, it has been determined that there has been no increase in real and dollar prices, and that there has even been a decline. The newly implemented support model has also failed to generate an increase in producer income in real and dollar terms. Empirical findings from the study reveal a nominal improvement, real decline paradox. Taking into account regional yield differences, particularly yield losses in the Thrace region, in price and support policies would be beneficial for sunflower cultivation.

Policy recommendations to be developed based on these data:

- Automatic determination of product and support prices indexed to inflation,
- Implementation of a premium system linked to yield and productivity, developed and applied in new support policies,
- Establishment of irrigation infrastructure, particularly in regions where it is urgently needed, to protect sunflowers from the effects of global climate change,
- Establishing multi-year, pre-determined support policies,
- Prioritising education and R&D activities.

Closing Turkey's vegetable oil deficit and ensuring food security depend on effective support policies for strategic products. It has become apparent that support policies must be redesigned not only to protect producer income but also to enhance the sector's competitiveness and sustainability in the long term.

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