Uluslararası Tarım Araştırmalarında Yenilikçi Yaklaşımlar Dergisi
International Journal of Innovative Approaches in Agricultural Research 2025, Vol. 9 (3), 176-190
https://doi.org/10.29329/ijiaar.2025.1356.2

Original article

Evaluation of Wheat in Türkiye in terms of Price and Agricultural Support Amounts

Metin Badem *

Department of Business Management, Çorlu Vocational School, Tekirdağ Namık Kemal University, Tekirdağ, Türkiye

Abstract

Agriculture is of strategic importance in Türkiye as in the whole world. Besides its strategic importance, agriculture involves risks and uncertainties due to its dependence on natural conditions. In this respect, the adequacy and sustainability of wheat, which constitutes the basic food raw material of humanity, has gained great importance for countries in recent years. Due to this feature of wheat, pricing and support of wheat is an important issue. In this study, wheat and support prices were analysed and evaluated in terms of current prices, real prices and dollar. It is seen that wheat prices have shown a significant increase in current prices but not in real and dollar prices. In terms of agricultural supports, it is seen that the support amounts of wheat, which has a share in area and premium-based supports, remained constant between 2001 and 2024 with 18.95 TL/da in real terms. In 2022-2023, it is seen that there has been a significant increase of 1000% in wheat premium support from 10krş/kg to 1 TL/kg. This study aims to contribute to the literature and stakeholders with panel data analysis of wheat agriculture, which is of great importance for our country, in terms of unit price and subsidies.

Keywords: Agriculture, Wheat, Wheat Prices, Wheat Subsidies, Türkiye.

Received: 11 November 2024 * **Accepted:** 15 September 2025 * **DOI:** https://doi.org/10.29329/ijiaar.2025.1356.2

* **Corresponding author:**

Metin Bağdem, Department of Business Management, Çorlu Vocational School, Tekirdağ Namık Kemal University, Tekirdağ, Türkiye.
Email: mbadem@nku.edu.tr

INTRODUCTION

Meeting the food needs of humanity without depleting the world's limited resources is one of the most important issues of recent years (Beltran-Peña, Rosa, & D'Odorico, 2020). It is predicted that the risk of access to food for the existing population will gradually increase towards 2050 due to the decreasing ability to increase the arable agricultural areas in the world, population growth and global climate changes. It is estimated that the existing agricultural production should be doubled by 2050 in order to feed the world population approaching nine billion. However, it is predicted that it is not possible to double the productivity in the current system in agricultural production (Ray et al., 2013).

The change in demographic structure, new eating habits and the ability to meet the world's limited agricultural production potential cause various concerns. Meeting the projected increase in food demand due to population growth and income growth has become one of the most important problems of humanity in the 2020s (Godfray, et al., 2010).

Wheat, which has an important place in the cereals group, is of great importance for the production of sufficient quantity and quality in terms of both human and animal nutrition (Yılmaz, 2022). Wheat is an agricultural product that plays an important role in feeding the world and improving global food security, which is the basis of human civilisation. Wheat, which is used in the production of flour products in the world, is of strategic importance especially for developing countries due to its agriculture and being a staple food. Wheat provides 20 per cent of the protein requirement worldwide (Shiferaw, et al. 2013).

Wheat is an annual plant that can be grown all over the world because it has varieties that can be produced in all climatic and soil conditions. The main reasons for the widespread cultivation of wheat are that it has many varieties, it has an important place in human and animal nutrition, it is widely used in industry and it can adapt to wide ecologies. For this reason, it is an agricultural product with the largest cultivation area in the world and in our country (Aykanat, 2018).

Wheat has an important cultivation area of 219 million hectares, which is 18% of the total 1.2 billion hectares in the world. In Türkiye, cereal and vegetable production is carried out on 16,720 hectares of the total agricultural area of 20,252 hectares. Wheat is produced in 68 million decares of this area (Tüik, 2024). Wheat is cultivated in approximately 40.8 per cent of the cultivated areas in Türkiye. In this sense, wheat is of strategic importance for producers and consumers. (Konyalı, 2008).

In this respect, the changes in agricultural product prices over time, as in other product prices, constitute one of the important subjects of analysis in terms of the national economy. While monthly and annual changes in product prices sometimes occur within a regular framework, sometimes they may occur in a highly irregular manner. Scientific price analyses will make great contributions to policy

makers and authorities to make healthy decisions and develop policies, especially by examining the current price increases caused by high inflation in recent years (Ukav, 2018).

Price analyses are one of the important tools that help in making production decisions. Price analyses to be made with scientific method will contribute to the determination of issues such as cultivation area, production amount and market delivery periods by producers. In this way, it will enable decision-makers to take clearer decisions in the implementation of basic policies, financial structure and support policies (Dağıstan and Erkan, 1999).

For this reason, it is important to analyse the evaluation of price and agricultural support policies applied in wheat, which is the main food source for sustainable wheat agriculture and basic food security of developing countries.

MATERIAL AND METHOD

The main material of the study is the evaluation of price and support policies in relation to the sustainability and sufficiency of wheat agriculture, which is a strategic product in Türkiye and in the world. For this evaluation, data from the Ministry of Agriculture and Forestry, Central Bank of the Republic of Türkiye, Presidency of Strategy and Budget, Ministry of Finance, TURKSTAT, FAOSTAT were used. Changes and fluctuations in the time series generated from these data are evaluated and interpreted.

In this context, in order to observe the changes in wheat price and agricultural subsidies given to wheat from past to present in a healthier and more understandable way, the Producer Price Index of 2003 was used for realisation. In order to evaluate the changes in wheat price and agricultural subsidies from different perspectives, they have been analysed in US Dollars. In this analysis, the foreign exchange rates of the Central Bank of the Republic of Türkiye (TCMB) were used.

For real product price and subsidy values:

- Real Wheat Price of the Relevant Year = (Current wheat price of the relevant year / PPI value of the relevant year)*100
- Real Subsidy Amount of the Relevant Year = (Current subsidy amount of the relevant year / PPI value of the relevant year) * 100

Formulae were utilised.

RESEARCH RESULTS AND DISCUSSION

Wheat Data in Türkiye

As of 2023, approximately 68 million decares of wheat was cultivated in Türkiye. As of 2002, wheat cultivation areas, which reached 93 million decares, entered a downward trend as of 2005 and

declined to 68 million decares. It is seen that wheat cultivation areas, which are in a decreasing trend, experienced a loss of 37% between 2002 and 2023 (Table 1). It is seen that the approximately 30 million decares that Türkiye has experienced in sowing areas is an important issue that should be evaluated in terms of wheat agriculture. Despite this decline in sowing areas, it is seen that there is not much change in the production amount of 20 million tonnes thanks to the increase in yield per unit area (Figure 1).

Table 1. Türkiye Wheat Sowing Areas, Yield and Production Amounts

Years	Wheat Sowing Area	Yield	Production Amount
2001	91.498.440	207.6	19.000.000
2002	92.829.100	210.0	19.500.000
2003	90.533.980	209.8	19.000.000
2004	92.682.400	226.5	21.000.000
2005	92.238.800	233.0	21.500.000
2006	84.807.300	235.9	20.010.000
2007	79.532.370	216.7	17.234.000
2008	75.825.310	234.5	17.782.000
2009	80.258.980	256.6	20.600.000
2010	80.630.070	244.0	19.674.000
2011	80.062.850	270.0	21.800.000
2012	75.216.900	267.2	20.100.000
2013	75.502.720	284.5	22.050.000
2014	78.207.500	242.9	19.000.000
2015	78.464.810	288.0	22.600.000
2016	76.098.680	270.0	20.600.000
2017	76.622.730	280.6	21.500.000
2018	72.886.220	242.9	19.000.000
2019	68.318.540	278.1	19.000.000
2020	69.146.320	296.4	20.500.000
2021	66.230.610	266.5	17.600.000
2022	66.018.050	299.1	19.750.000
2023	68.326.019	318.0	22.000.000

Source: Constructed by the author from FAOSTAT, TurkStat data.

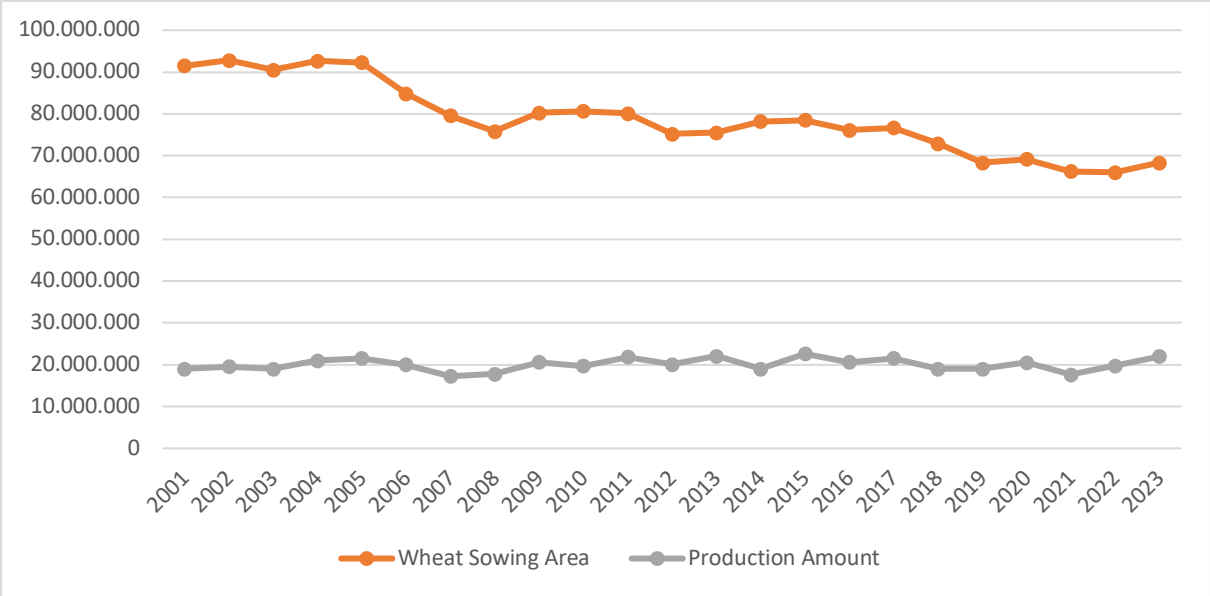

Figure 1. Türkiye Wheat Sowing Area and Production Amount

Türkiye has a share of 3.1% in terms of cultivation areas in the world with 68 million decares of wheat cultivation. Türkiye ranks 10th in the world wheat production with a production of approximately 20 million (Polat, 2023). Since Türkiye's self-sufficiency rate in wheat production is 95.9%, we can talk about a balance between wheat imports and exports. While the rate of increase in exports has been 2.6 over the years, the rate of increase in imports has been 3 (TÜİK, 2023). As of 2010, exports increased from 3.3 million tonnes to 8 million tonnes, while imports increased from 4.1 million tonnes to 12.2 million tonnes (Table 2).

Table 2. Türkiye's Wheat Import and Export Quantities (tonnes)

Years	Export	Import
2010	3.228.101	4.174.105
2011	3.977.079	3.224.535
2012	3.700.742	4.029.699
2013	4.677.855	4.185.189
2014	4.358.527	5.780.716
2015	5.918.407	4.109.527
2016	7.463.969	4.586.405
2017	7.489.664	6.109.569
2018	7.873.454	6.467.562
2019	7.530.767	10.793.317
2020	7.583.765	8.237.981
2021	7.898.000	9.525.000
2022	8.028.000	12.208.000

Source: TÜİK

It is seen that Türkiye had a balance between imports and exports between 2010 and 2018, but after 2018, due to the increasing demand due to population growth, the sufficiency rate of 102%

decreased to 95%, causing an increase in imports, and wheat imports increased to 12.2 million tonnes while exports were 8 million tonnes (Figure 2).

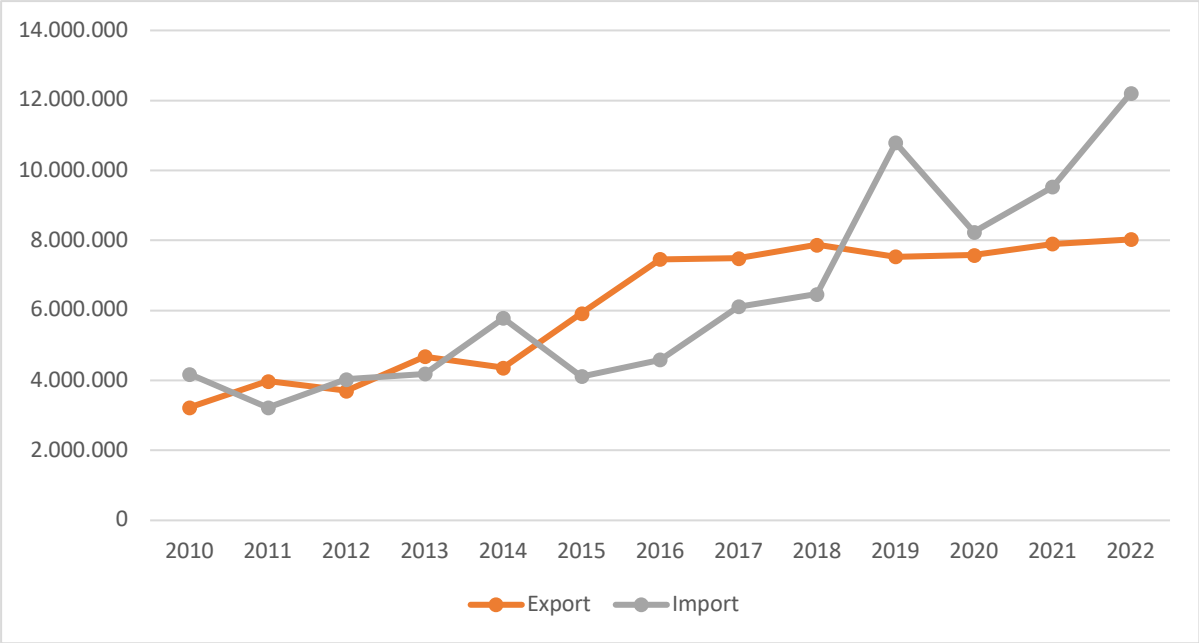

Figure 2. Türkiye's Wheat Imports and Exports by Years

In 2001, the wheat price was 164 krş/kg and has been stable due to low inflation and world markets. With current prices, the most significant wheat price increase is observed in 2021-2022 with 168.8%. As of 2018, the wheat price of 1.05 TL/kg in 2023 reached 8.25 TL/kg with an increase of 685.7%. The wheat base price announced in 2024 was determined as 9.25 TL/kg with an increase of 12.1%.

As of 2001, the wheat price, which was 31krş/kg in real prices, increased by 6.4% to 33 krş/kg. Depending on real prices, the wheat price in Türkiye reached the highest value in 2022 with 37 krş/kg. The lowest real price was calculated as 28 krş/kg in 2018 (Table 3).

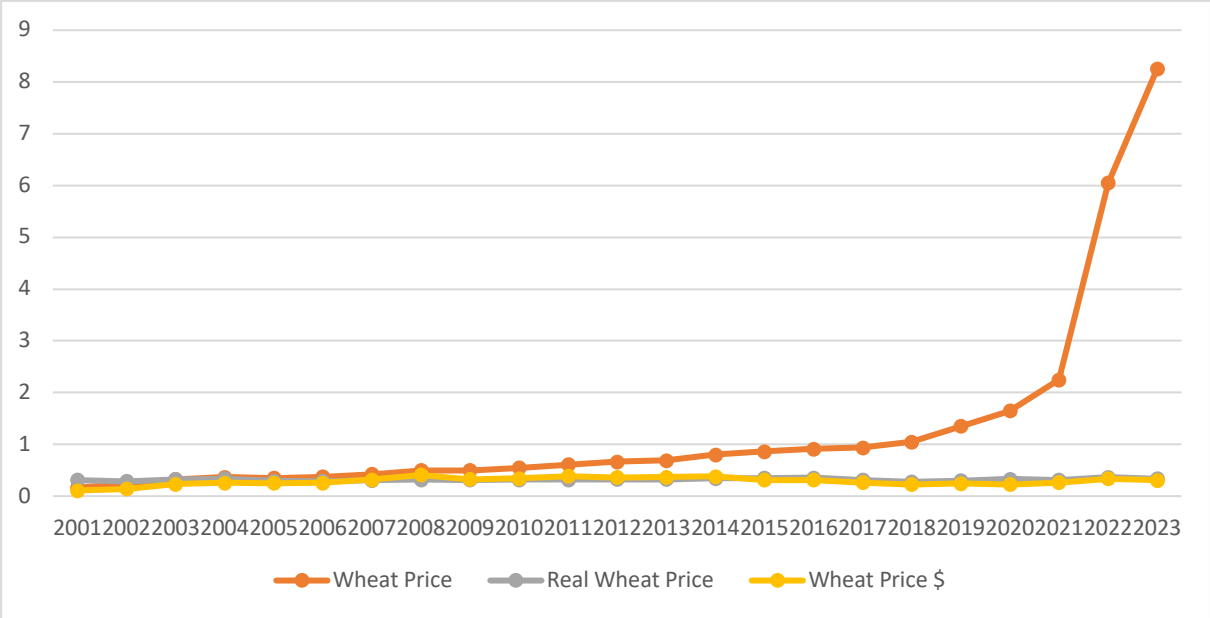

Figure 3. Türkiye's Wheat Price, Real Price of Wheat and Wheat Price in Dollars by Years

In monitoring the change in wheat price over the years, the $ price equivalent was utilised. It is seen that the wheat price of 110$/ton in 2001 increased to 310$/ton in 2023 (Figure 3). Identical to the world markets, it is seen that the highest price on $ basis in these years was 410$/ton in 2008 (Table 3).

Table 3. Current Price, Real Price and Dollar Prices of Wheat in Türkiye by Years

Years	Wheat Price	Real Wheat Price	Wheat Price $	Total Return TL	Real Return TL	Total Return $
2001	0,164	0,31	0,11	34,11	64,59	22,97
2002	0,23	0,29	0,14	48,30	60,92	29,51
2003	0,325	0,33	0,23	68,25	68,26	49,14
2004	0,371	0,34	0,26	82,73	74,82	56,98
2005	0,35	0,29	0,25	81,55	68,13	58,92
2006	0,375	0,29	0,25	88,50	67,36	60,12
2007	0,425	0,30	0,32	92,23	66,03	69,34
2008	0,5	0,32	0,41	117,50	74,64	96,00
2009	0,5	0,31	0,33	128,50	80,63	83,88
2010	0,55	0,32	0,34	134,20	77,60	83,61
2011	0,61	0,32	0,39	164,70	85,73	104,31
2012	0,665	0,33	0,36	177,56	87,11	96,55
2013	0,69	0,32	0,37	196,65	92,34	104,10
2014	0,8	0,34	0,38	194,40	82,80	92,88
2015	0,86	0,35	0,31	247,68	100,20	90,26
2016	0,91	0,35	0,31	245,70	95,30	84,35
2017	0,94	0,31	0,27	263,20	88,14	74,39
2018	1,05	0,28	0,23	287,70	75,86	62,31
2019	1,35	0,30	0,24	375,30	84,17	67,25

2020	1,65	0,33	0,22	488,40	97,65	66,30
2021	2,25	0,31	0,27	598,50	83,18	70,55
2022	6,05	0,37	0,34	1808,95	110,04	100,66
2023	8,25	0,33	0,31	2623,50	106,44	97,35

Source: Ministry of Agriculture and Forestry, TMO, Central Bank data and data compiled by the author.

In Table 3, based on TURKSTAT data, the income obtained by wheat producers from one decare of wheat area is calculated by multiplying the wheat yield in Türkiye by the base price determined by the state on a yearly basis. In 2001, the producer earned 34.11 TL/da and in 2019, the producer earned 375.30 TL/da. Between 2001 and 2023, the real income obtained by wheat producers increased by 64% and reached 106.4 TL/da. However, it is observed that there are decreases in real income in some years. For example, there was a significant decrease of 13.4% in 2017-2018 (Table 3). The highest yield per unit area in US dollars was in 2011 with $104.31.

When the real price of wheat in Türkiye is compared with the $-based price, it is seen that the real price followed a more stable course between 2001 and 2023, but when analysed as the dollar price of wheat, it is seen that it increased from 11 cents/kg to 31 cents/kg (Figure 4).

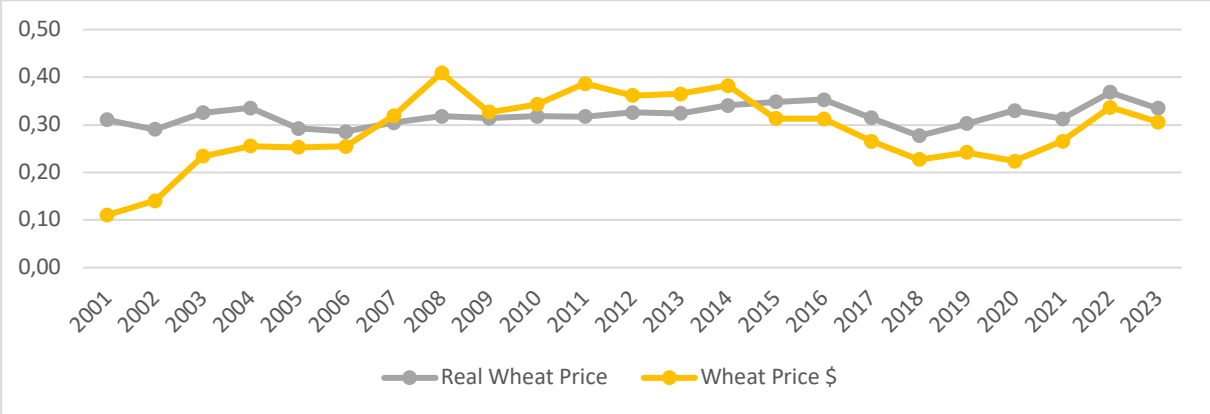

Figure 4. Wheat Price in Türkiye in Real Terms and Comparison with US Dollar

Wheat Agricultural Support Data in Türkiye

As in the whole world, the sustainability and sufficiency of wheat production, which is an important agricultural activity, is of great importance in ensuring the food security of countries. Although agriculture has a strategic importance in terms of the task it undertakes, it differs from other sectors with some features. One of these features is its high dependence on natural events. The dependence of agriculture on natural conditions leads to production, price formation, marketing, consumption and low income. The supply elasticity of agricultural products, as well as increases and decreases in demand, leads to an imbalance in producer incomes. Such reasons make it necessary to support agricultural activities with agricultural support policies (Aktaş, Songur and Altıok, 2015), (Kıymaz, 2008).

In general, agricultural support is defined as a set of measures taken to protect agriculture, encourage agricultural production and ensure the sustainability of agriculture (Eraktan, 2001). Although agricultural support policies vary from country to country, their general objectives are to increase the income level of the agricultural sector, to direct production and prices, to increase productivity and quality, to ensure balanced use of natural resources, to ensure rural development and to direct the agricultural sector in line with macroeconomic objectives (Çomaktekin, 2009), ('Agricultural Law No. 5488', 2006). The main approach of Türkiye's agricultural support policy is production policy. The production, price and area supports implemented are aimed at increasing production (Demirdöğen, 2019).

A new understanding was introduced to agricultural support policies within the scope of the Agricultural Reform Implementation Project (ARIP), which was put into practice in 2001 by putting an end to the price-oriented support policies that had been going on for many years in Türkiye (Badem and Hurma, 2021). Based on this new support policy, agricultural support instruments according to the relevant law:

- Area-based agricultural support payments
- Compensatory payments
- Difference payment (Premium) supports
- Livestock supports
- Agricultural supports for rural development
- Agricultural insurance support services
- Other supports for agricultural purposes (TOB, 2024).

In Türkiye, wheat producers benefit from area-based supports and differential payment (premium) support. The area-based supports include diesel fertiliser support, certified seed and sapling use, hazelnut and yield loss support. It is seen that area-based supports have a share of 25.9% in the total support amount with 23.7 billion TL as of 2024. Wheat producers benefit from diesel, fertiliser and certified seed use support from this support group. In 2024, the diesel and fertiliser support received by wheat producers is 21 billion TL and has a share of 23% in area-based support (TOB, 2024).

Premium support, which is the most important support item for wheat producers, includes support for oilseeds, cereals and pulses, tea, grain corn, olive and olive oil and has a share of 27.2% in total support with 24.9 billion TL as of 2024 (TOB 2024).

Table 5. Area-based and Premium-based supports, Total Wheat Support, Total Real Wheat Support and Wheat Support in Dollars at Current Prices in Türkiye by Years

Years	Area Based Supports	Premium Support	Total premium	Total Support	Total Real Support	Total Support $
2001	10,00	0	0,00	10,00	18,94	6,73
2002	15,45	0	0,00	15,45	19,49	9,44
2003	17,95	0	0,00	17,95	17,95	12,92
2004	20,00	0	0,00	20,00	18,09	13,77
2005	10,00	0,03	6,99	16,99	14,20	12,28
2006	15,01	0,04	9,44	24,45	18,61	16,61
2007	12,01	0,05	10,85	22,86	16,37	17,19
2008	6,76	0,05	11,75	18,51	11,76	15,12
2009	7,50	0,05	12,85	20,35	12,77	13,28
2010	7,50	0,05	12,20	19,70	11,39	12,27
2011	8,50	0,05	13,50	22,00	11,45	13,93
2012	9,00	0,05	13,35	22,35	10,97	12,15
2013	9,80	0,05	14,25	24,05	11,29	12,73
2014	10,60	0,05	12,15	22,75	9,69	10,87
2015	11,45	0,05	14,40	25,85	10,46	9,42
2016	11,00	0,05	13,50	24,50	9,50	8,41
2017	17,00	0,05	14,00	31,00	10,38	8,76
2018	19,00	0,05	13,70	32,70	8,62	7,08
2019	27,00	0,1	27,80	54,80	12,29	9,82
2020	27,00	0,1	29,60	56,60	11,32	7,68
2021	42,00	0,1	26,60	68,60	9,53	8,09
2022	121,00	0,1	29,90	150,90	9,18	8,40
2023	149,00	1,0	318,00	467,00	18,95	11,68

Source: Constructed by the author using data from the Ministry of Agriculture and Forestry, Central Bank.

When agricultural supports are analysed with current prices, it is seen that area-based (diesel and fertiliser) supports increased by 288% from 42 TL/da in 2021 to 121 TL/da in 2022. In 2023, this figure increased by 23.1% and reached 149 TL/da (Table 5). The increase rate of total current supports from 2021 to 2022 was calculated as 219.9% TL/da. Premium supports, another important item in agricultural supports, remained constant at 5 krş/da between 2007-2018, but increased by 100% between 2019-2022 and reached 10 krş/da (Figure 5). In wheat, it increased by 1000% by 2023 and reached 1 TL/da.

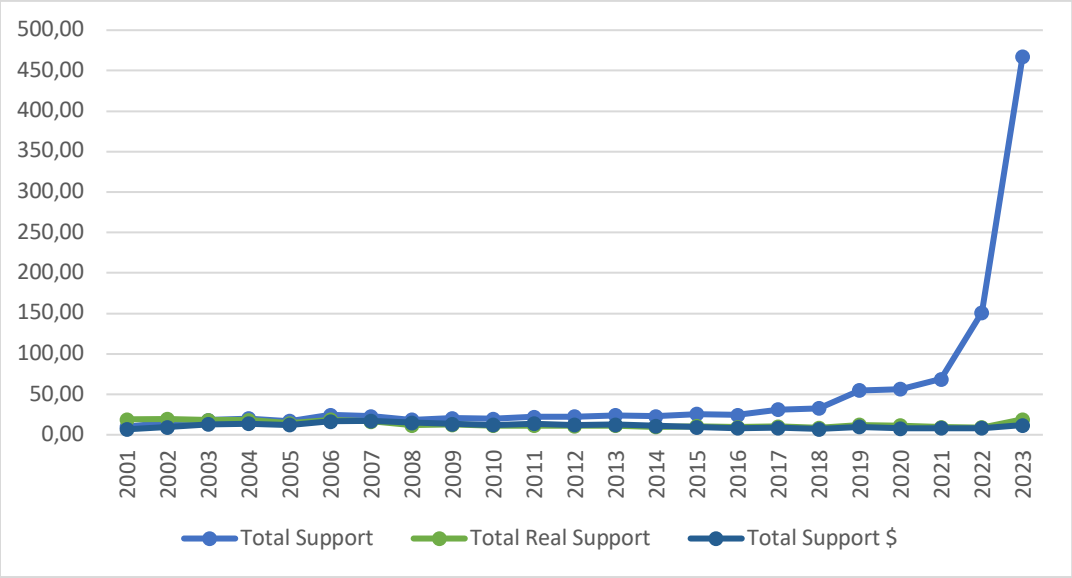

Figure 5. Agricultural Support Amounts (Current, Real and Dollar Price) Received by Wheat Producers per Unit Area in Türkiye

As of 2022, the total agricultural support for wheat is 150.90 TL/ha and the share of area-based support is 80% while the share of premium-based support is 20%. However, in 2023, as a result of subtracting 1 TL/kg of premium support per kg of wheat and multiplying it by 318 kg, which is Türkiye's wheat yield average, it increased to 318 TL/kg. As of 2023, the share of area-based supports in total agricultural supports is 32 per cent, while the share of premium-based supports increases to 68 per cent (Table 5).

The figure of real agricultural supports in 2001 was 18.94 TL/da and it is seen that this figure has the same value in 2023. It is seen that real agricultural supports reached the highest figure in 2002 with 19.49 TL/da and experienced a fluctuation by decreasing in real terms until 2023. It is seen that total agricultural supports in US dollars reached the highest figure in 2007 with $17.19/da and this figure is around $8/da between 2014-2022.

Between 2001 and 2023, the decare yield of wheat producers increased 77 times and reached 2,623.50 TL/da. During these years, the area-based and premium-based agricultural supports received by wheat producers increased 46.7 times and reached 467 TL/da (Table 6).

Table 6. Ratio of Total Agricultural Supports to Total Return in Türkiye Wheat Agriculture

Years	Total Return	Total Support	Total Support / Total Return
2001	34,11	10,00	0,29
2002	48,30	15,45	0,32
2003	68,25	17,95	0,26
2004	82,73	20,00	0,24
2005	81,55	16,99	0,21
2006	88,50	24,45	0,28

2007	92,23	22,86	0,25
2008	117,50	18,51	0,16
2009	128,50	20,35	0,16
2010	134,20	19,70	0,15
2011	164,70	22,00	0,13
2012	177,56	22,35	0,13
2013	196,65	24,05	0,12
2014	194,40	22,75	0,12
2015	247,68	25,85	0,10
2016	245,70	24,50	0,10
2017	263,20	31,00	0,12
2018	287,70	32,70	0,11
2019	375,30	54,80	0,15
2020	488,40	56,60	0,12
2021	598,50	68,60	0,11
2022	1808,95	150,90	0,08
2023	2623,50	467,00	0,18

Source: Constructed by the author using data from the Ministry of Agriculture and Forestry.

In addition to the total return obtained from the unit area as a result of multiplying the wheat yield by the base price announced by the government, total agricultural support was calculated as a result of the sum of the area-based support applied by the government and the premium support applied in strategic products. As of 2023, the average decare yield of a farmer producing wheat in Türkiye is 2,623.50 TL/ha. Depending on the agricultural support policies provided by the state, the total support received by the producer from the decare is 467 TL/da. While there was an average support rate of 20% between 2001-2007, the share of average support in total income decreased to 10% between 2008-2022. In 2023, it is seen that this ratio increased to 18%, especially with the increase in premium support and area-based support (Table 6).

CONCLUSIONS AND RECOMMENDATIONS

In this study, the pricing of wheat production and support policies in Türkiye have been evaluated in general. Wheat is a strategic product for the whole world. Today, when the world wheat production has reached 800 million tonnes, Türkiye's average wheat production is around 20 million tonnes. Türkiye's wheat cultivation area, which was 96 million decares at the beginning of the 2000s, decreased to 66 million decares with a significant loss of 30 million decares. However, it is seen that the amount of wheat production is around 20 million tonnes due to the increase in yield.

It is seen that wheat cultivation areas in Türkiye entered a significant downward trend after 2010 and decreased from 80.5 million decares to 66 million decares. When we look at the wheat price in terms of the relevant years, it is seen that the price of wheat, which was 325 TL/ton in 2003, increased by 69% to 550 TL/ton in 2010. After this stage, it is seen that there has been a significant decrease of 5 million

decares in wheat cultivation areas. In this year, there was an increase of 26 kg/da in unit area yield. An important point that needs to be determined here is what is produced on the 30 million decares of land where wheat cultivation was abandoned.

It is known that wheat prices have a significant impact on cultivation areas. For example, it is seen that the price of 2.25 TL/kg in 2021 increased to 6.05 TL/kg in 2022, which is one of the important reasons why the cultivation area, which was 66 million decares in 2022, increased to 68 million decares in 2023.

Another important factor that has a great impact on wheat cultivation area and production amount is the agricultural support amounts paid depending on agricultural policies. There are two main support items for wheat. These are area-based supports (diesel-fertiliser) and premium-based supports. It is observed that area-based supports followed an approximately constant course between 2001-2020, but showed a significant increase of 288% in 2021-2022. Premium support, which is another important type of support for wheat, increased from 3 krş/kg in 2005 to 10 krş/kg in 2022. This limited premium increase is seen as another important reason for the decrease in wheat cultivation areas. In 2023, the wheat premium increase was 1 TL/kg with an increase of 1000%.

In the globalising world, it is among the demands of developed countries that the liberal trade understanding also covers the agricultural sector. As in all agricultural products, competitiveness in wheat agriculture, which concerns the whole world, is of great importance for a country. The first condition of profitability in wheat agriculture is cost and pricing. While producers are integrated with world prices, the amount of product obtained from unit area is inevitable. For example, while Türkiye's average wheat yield per unit area is 300 kg/ha, the world yield is 350 kg/ha. This figure is 565 kg/da in China and 546 kg/da in the EU. Countries such as USA, Russia and India, which have a say in the world wheat market, are close to Türkiye in terms of yield.

Another important factor that increases competitiveness in wheat is that basic input costs are equal to or below the world markets. However, foreign dependence on inputs such as diesel, fertiliser and pesticides reduces Türkiye's competitiveness.

For Türkiye's sustainable wheat agriculture, it has become necessary to protect lands with yields at or above the world average and to stop the areas that have been opened for development due to industrialisation and migration in this region.

Türkiye is among the top ten countries in the world wheat production, with 8 million tonnes of annual wheat exports and 12 million tonnes of annual wheat imports. In this respect, the unit price of wheat and the amount of support are vital issues. It is seen that Türkiye will increase its competitiveness in wheat, which is a strategic product, with the right pricing and support policies.

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