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## THE SIGNIFICANCE OF THE HUNGARIAN WHEAT PRODUCTION IN RELATION TO THE COMMON AGRICULTURAL POLICY

TAMÁS MIZIK<sup>1</sup>, ZOLTÁN MÁTÉ RÁDAI<sup>1</sup>

Corvinus University of Budapest, 1093 Budapest, Fővám tér 8.

\*Corresponding author: [tamas.mizik@uni-corvinus.hu](mailto:tamas.mizik@uni-corvinus.hu)

### ABSTRACT

Wheat is one of the most important domestic crops, as well as one of the most important cereals. It has a wide range of use, not only for making basic foods but it is also widely used for animal feeding. The market competitiveness of the production can be measured in different ways. The average yield is one of them, which fluctuates strongly from year to year, mostly driven by weather conditions. Besides, the use of proper seeds and fertilizer, especially nitrogen and potassium, is essential. On the sales side, the price determines the effectiveness of production. Of course, the impacts of the Common Agricultural Policy should not be ignored as direct payments contributed to the gross revenue of crop producers by 57.2% on average. The aim of the article is to present these elements between 2010 and 2020 and to formulate agricultural policy recommendations based on the results obtained. The production and export of higher value-added products, such as various durable foods, but at least seed or durum variety, should be a priority of the Hungarian agricultural policy. This could also stimulate the manufacturing industry, which would have a positive employment effect in addition to an even larger trade surplus. However, the tremendous, 30% price increase in 2021 may not encourage the different stakeholders of the supply chain for any changes.

**Keywords:** wheat production, international trade, common agricultural policy

### INTRODUCTION

Hunger and malnutrition are enormous problems, and 2.8 billion people suffer from them (FAO, 2017). Taking into consideration the continuously growing population, agriculture will face an even higher need for productivity. Hungary has excellent endowments for crops production and achieves a significant trade surplus. However, production suffers from different weather-related problems such as droughts and heatwaves. Nevertheless, wheat has traditionally been an important product of Hungary due to its diverse usability and good market potential.

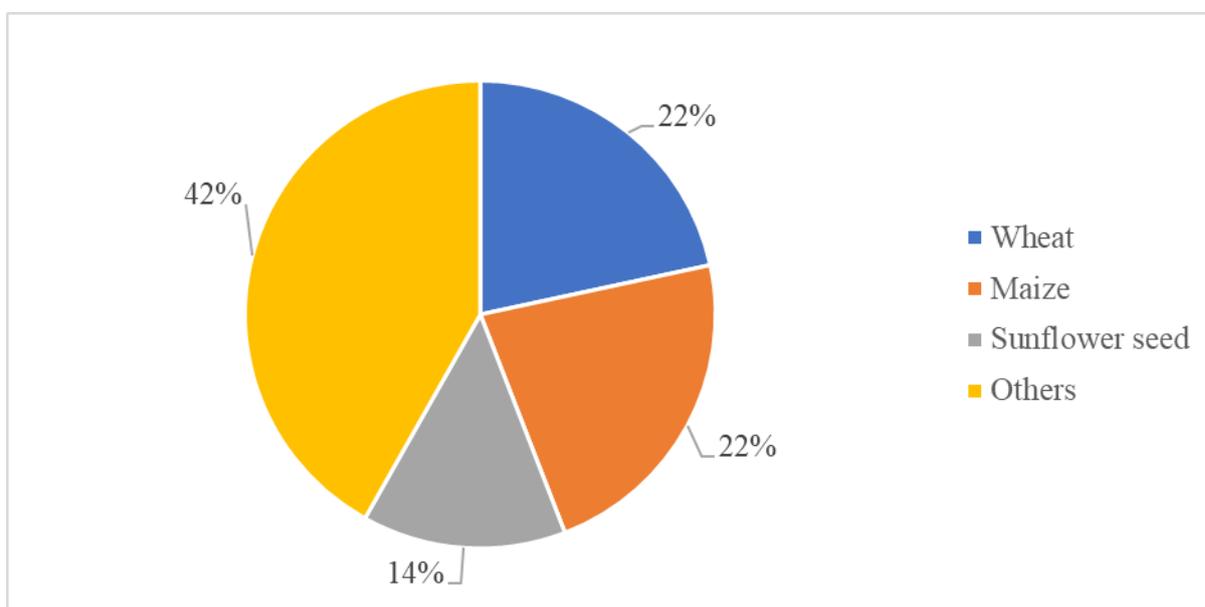
Besides endowments, it should not be forgotten that the various EU supports play an important role in Hungarian agriculture. In the case of crop producers, direct payments of the Common Agricultural Policy (CAP) have a 57.2% share on average in their gross revenue (KESZTHELYI – KIS CSATÁRI, 2020). This indicates a huge support dependency and questions the overall competitiveness of this sector.

Wheat plays an important role in the Hungarian agricultural trade as production always surpasses domestic consumption. However, its relatively low unit value limits the exportation of the raw material as transportation cost increases proportionally with the distance. Only (further) processing can make it possible to reach distant markets with any crop products.

The article is organized as follows. The next section gives an overview of Hungarian wheat production. This is followed by the characteristics of the Hungarian wheat use. The last section summarizes our results and provides concluding remarks.

### Characteristics of the Hungarian wheat production

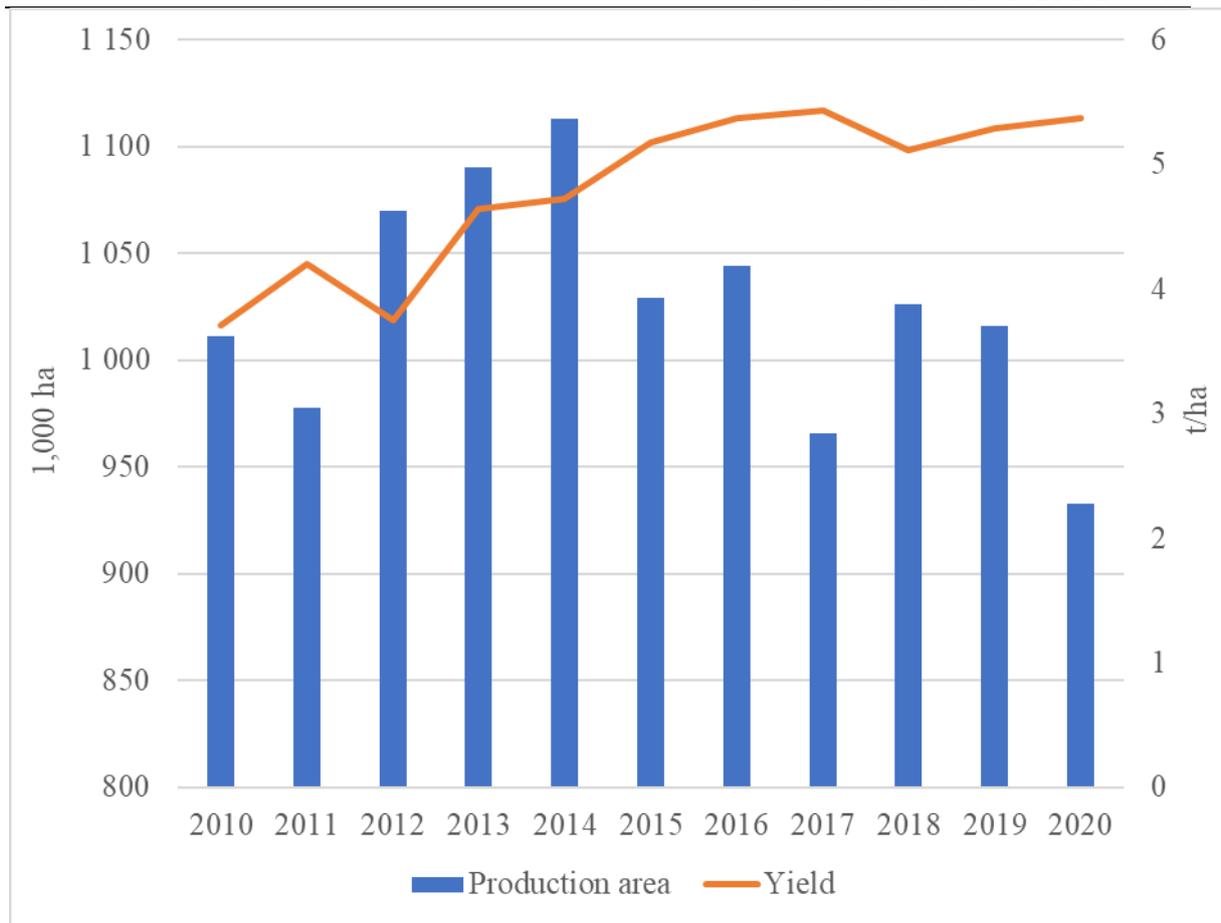
Wheat is one of the most important crop type in Hungary and its role within cereals is also significant. It is further supported by its high land use share, which is shown in *Figure 1*. Based on this, it can be said that the production area of wheat and maize was almost the same in 2020, so by far, these two are the most significant arable crops. The share of sunflower is roughly half compared to the two above (14%), while rapeseed and various fodder crops are in the other category.



**Figure 1.** The most important in-land crops, 2020 based on HCSO (2021a) and HCSO (2019) data

The important role of wheat in terms of both supply and demand can be justified by several factors. On the supply side, it is worth highlighting, for example, that the Hungarian arable land is excellent for cultivation, the weather conditions are appropriate, the expertise and significant production experience of farmers are present. On the demand side, the most important aspect is the widespread use of wheat, as it is the raw material for many basic foods (such as bread and various bakery products), feed wheat is an important raw material in livestock breeding, and also its industrial use should not be ignored (ethanol or starch production). As the production level significantly exceeds the domestic market demand, wheat is also an important agricultural export product.

There are two factors of wheat production: the area used for production and the average yield. The development of these two elements is illustrated in *Figure 2* for the last 11 years (2010-2020).



**Figure 2.** Area used for wheat production and average yield, 2010-2020 based on HCSO (2021a) data

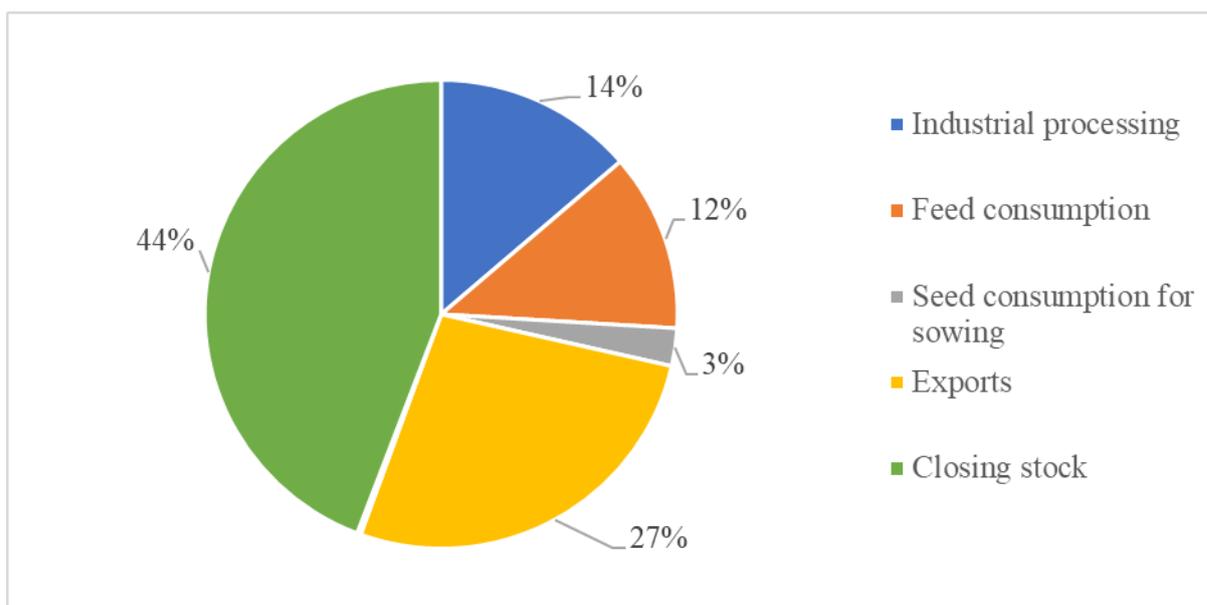
Based on the figure, the strong fluctuation of the harvested area can be seen during the study period, with the two extremes being 933 thousand hectares (2020) and 1,113 thousand hectares (2014), resulting in an average value of 1025 thousand hectares in the whole period. This is fundamentally determined by the characteristics of the production technology being used (mainly the crop rotation) in addition to the expected and actual market conditions. To put this value in a broader context, it can be seen that the area used for wheat production purposes occupies 22-26% of Hungarian arable land used for cereals production, which proportion is the same as that of maize.

The other crucial component of production is yield, which has increased significantly, by almost 45% over the last 11 years. One of the most significant factors in its development is the weather condition. When this was not favorable, a substantial production decrease occurred. Figure 2 clearly shows how the – typically substantial – upward trend is broken by the year 2012 when there was both drought and record warm weather. However, it is worth highlighting that even the result of 3.75 t/ha at that time was higher than the 3.71 t/ha value recorded in 2010. BOGNÁR ET AL. (2017) improved a wheat yield forecast method that reached high accuracy in Hungary, however, handling unexpected stress events remained a significant challenge. The best result of the analyzed period was 5.43 t/ha, recorded in 2017, which can certainly be surpassed in the near future by using more

efficient seeds and modern technology (such as precision farming). PINKE ET AL. (2020) analyzed the impacts of groundwater levels on wheat and maize. Based on their results, lower groundwater levels did not significantly affect wheat yields, while they resulted in 18-38% maize yield variability. Furthermore, the important role of fertilization, which is appropriate for the given soil conditions and for the needs of wheat also plays an important role. In terms of active ingredients, this means that for every tonne of wheat produced, 25-29 kg of nitrogen, 12-15 kg of phosphorus and 18-22 kg of potassium are required, which is 5.43 times of these values for the 2017 harvest (PÁLMAI – HORVÁTH, 2016). PÁLMAI and HORVÁTH (2016) also highlighted that among our cultivated crops, mainly cereals, especially winter wheat, are the most sensitive to nitrogen supply.

### Characteristics of the Hungarian wheat usage

Wheat can be used for many different purposes. The magnitude of the wheat stock available in each year is determined by the production, usage, and stocks accumulated in previous years. The composition of the different purposes of use is illustrated in *Figure 3*.



**Figure 3.** Purposes of wheat use, 2019 based on HCSO (2021a) data

*Figure 3* shows that most of the 9.14 million tonnes of wheat used in 2019 were stored (closing stock), followed by exports (27%). Industrial and feed use accounted for 14% and 12%, respectively, while 3% was used as seeds. As the loss was only 0.26%, this item is not even shown in the figure above. 13.70% of the total amount served human nutrition directly (HCSO, 2021b).

As wheat is an important export commodity, it is also worth looking at the foreign trade performance of the sector. Table 1 shows the volume and value of exports and imports, and the trade balance, with the average price observed in each relation too.

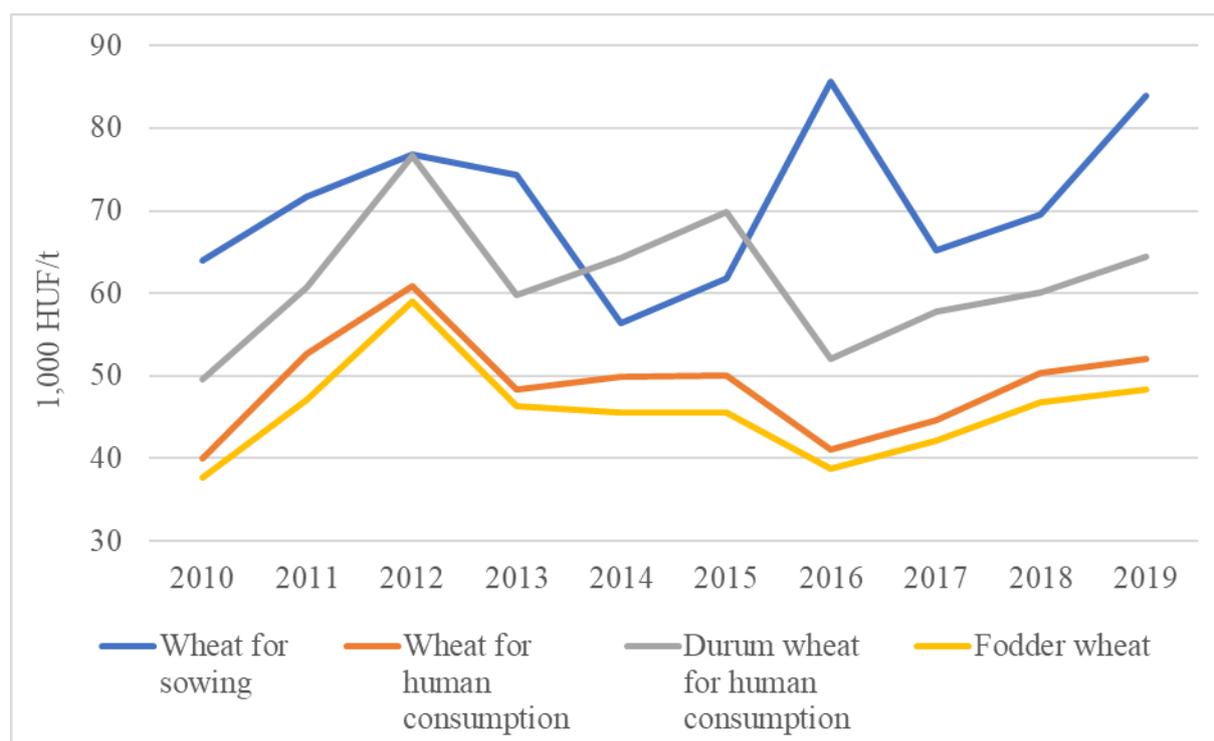
**Table 1.** Cornerstones of wheat trade, 2019

	Volume (t)	Value (million HUF)	Average price (1,000 HUF/t)
Import	115,803	7,524	64.97
Export	2,467,545	151,816	61.53
Trade balance	2,351,742	144,292	

Based on HCSO (2021b) data

Table 1 shows that the export value is 2.35 million tonnes more than the import value. This means a surplus of more than 144 billion HUF. In terms of average price, there is no significant difference between exports and imports, so it is likely that there is no significant difference in their qualities.

As has already been mentioned, wheat can be used for various purposes. As a result, different varieties are grown to meet each purpose. Feed wheat lags behind milled wheat for human consumption in terms of quality, which is obviously reflected in the price of the product. Figure 4 shows the price level changes of each wheat variety during the analyzed period. Although official data of the Hungarian Central Statistical Office is not yet available for 2020, Hungarian wheat prices slightly increased in 2020, which was followed by an enormous, 30% increase in 2021 (PÁSZTOR – ECSEDINÉ WANEK, 2021).



**Figure 4.** Price development of various wheat types, 2010-2019 based on HCSO (2021c) data

Figure 4 shows the price difference between each variety: in general, the seed is the most expensive, followed by durum wheat and wheat for food, while feed wheat is the cheapest. The difference was the highest in 2016, when the price of wheat seed was 64% higher than

that of durum wheat and 109% and 121% higher than that of food and feed wheat, respectively. Exceptions to this basic context are the years 2014 and 2015 when the price of durum wheat also exceeded that of seed. It is likely that this was due to the development of the production area, which meant a constraint on the supply side and thus resulted in a substantial increase in prices. However, the significant rise in prices triggered an adjustment in supply and the durum wheat area has expanded significantly in recent years. This is shown in *Table 2*.

**Table 2.** Importance of durum wheat production, 2010-2020

Year	Durum wheat production area (thousand ha)	Production area share in the total area used for wheat production purposes
2010	14	1.34%
2011	12	1.25%
2012	12	1.14%
2013	15	1.34%
2014	14	1.30%
2015	19	1.85%
2016	30	2.87%
2017	34	3.52%
2018	44	4.29%
2019	37	3.64%
2020	27	2.89%

Based on HCSO (2021a) data

The durum area has increased in recent years, but it still has never reached 5% of the total wheat area in any of the analyzed years. Although the cultivation technology is not significantly different from that of autumn or spring wheat, solvent, secure foreign markets are more important due to the higher price level. On the demand side, however, growing nutrient intolerance (especially for gluten) may be a disincentive. In general, the role of pasta in healthy diet is reduced, so it is only worthwhile to start producing durum wheat if the market opportunities are appropriate.

## DISCUSSION

Wheat plays an important role in domestic crop production. This is reinforced by the fact that farmers sowed almost a quarter of the available arable land with it. In light of this, the complex management of appropriate production techniques, proper plant nutrient requirements and soil conditions are crucial, especially with regard to nitrogen use. Although a healthy lifestyle and an increase in the number of gluten-sensitive people are unfavorable for the wheat market, this is not expected to lead to a significant drop in demand for a long time, especially due to diverse use purposes (e.g. feed, ethanol or starch production). However, it should not be overlooked that wheat is a significant export item. Its export surplus exceeded HUF 144 billion in 2019. However, it should be noted that crop production, in general, is a significant beneficiary of the CAP implicating a

potentially dangerous support dependency. As the future of the CAP points to the lower and more targeted supports, Hungarian wheat producers should increase their efficiency and competitiveness if they want to maintain their current market position.

As the Hungarian market is relatively small, the profitability of production is mainly determined by world market prices. From this point of view, it is worth noting that in 2021 the market price increased by 30% compared to the same period of the previous year. There are different options available for better production performance on both supply and demand side. Regarding the supply side, creating modern seeds, adequate nutrient management or possibly irrigation would be the most promising option. On the demand side, building secure export markets would be the most important. This is exponentially true for higher-priced durum wheat, which, however, typically has only 3-4% of the total wheat area.

The increase in domestic demand would have a positive effect on the security and profitability of the production, as well as reducing the otherwise relatively high unit cost of transport. The production and export of higher value-added products, such as flour and various durable foods, should be a primary objective of the agricultural policy. By strengthening the wheat-based processing industry, a much greater added value could be produced, which can allow even economical transport over long geographical distances. In addition, all this would have a positive employment effect.

### ACKNOWLEDGEMENTS

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