

ASPECTS REGARDING THE PRODUCTION AND MARKETING OF CEREALS IN THE BLACK SEA BASIN AREA

Irina-Adriana CHIURCIU¹, Elena SOARE¹, Dan Marius VOICILAȘ², Ion CERTAN¹

¹University of Agronomic Sciences and Veterinary Medicine Bucharest, 59 Marasti Boulevard, District 1, 011464, Bucharest, Romania, Phone: +40213182564, Fax: +40213182888, Mobile: +40744 6474 10, Emails: chiurciu.irina@managusamv.ro, soare.elena@managusamv.ro, ion.certan@qlab.usamv.ro,

²Institute of Agricultural Economics, Bucharest, 13 Calea 13 Septembrie, District 5, Bucharest, Romania, Email: dmvoici@yahoo.com

Corresponding author: soare.elena@managusamv.ro

Abstract

Cereals are the most produced commodity worldwide, according to statistical data. Among the top ten countries in the list of the most important producers of corn and wheat respectively, as well as among the largest exporters of these categories of cereals, there are two countries located in the Black Sea basin, Ukraine and the Russian Federation. Other important competitors in the region were Romania and Turkey, who took 3rd or 4th place in corn or wheat production. At the same time, Romania occupied the 6th place in the ranking of corn exporters worldwide and 9th in that of wheat exporters in 2021. In addition to the four states mentioned before, in the paper, in the area related to the maritime basin, Armenia, Bulgaria, Georgia, Azerbaijan, Republic of Moldova and Greece were also included. The paper aimed to provide a coherent picture of competitiveness on the grain market, at the Black Sea basin level, and, at the same time, to highlight the position that Romania occupies in the economy of the area and in the world grain trade. For this purpose, the areas cultivated with corn and wheat were presented, as well as the productions obtained in the period 2015-2021 in the countries of the area related to the Black Sea basin, then the value imports and exports of corn and wheat that these countries recorded.

Key words: Black Sea basin, maize, wheat, production, export, import, Romania

INTRODUCTION

With the planet's population growing at an accelerated pace, the agricultural pioneers of the world's countries have sought and continue to seek solutions to ensure food security. In this context, cereals are needed to provide some of the food to the world's population. In addition to their nutritional properties, grains are preferred because they can be transported long distances and are less perishable [14]. Currently, the importance of cereals for human nutrition is enormous, as it accounts for about 45% of the world's energy source. Due to this, it was observed from the statistical data that half of the global arable area is cultivated with cereals [12]. Cereals occupied the first place in the most produced commodities worldwide between 2015 and 2021, with an average production for the mentioned period of 2,952,032,308.99 thousand tons [5]. Estimates predict an increase in average production per hectare for

the most important cereals [13]. Cereals have found favourable growing conditions in the Black Sea Area. The variety of pedoclimatic conditions, as well as the technologies applied, made the difference in terms of the results obtained in the cereal sector in the mentioned area. It should be noted that both the area cultivated with cereals and the production differ in the countries of this region, which has led to a differentiated contribution to the economy of the area. Wheat and corn are the most cultivated of the cereal category. The Black Sea represents, according to specialists, a unique sea basin, characterized among others by biodiversity, abundant wildlife, varied and valuable natural resources [11]. From a geopolitical point of view, the Black Sea Basin includes the Black Sea area, the riparian states (Ukraine, Russia, Georgia, Turkey, Bulgaria and Romania), as well as states or regions from states in their vicinity such as: Armenia, Republic of Moldova, Azerbaijan (which are part of the

Extended Black Sea Area [4]) and Greece [11].

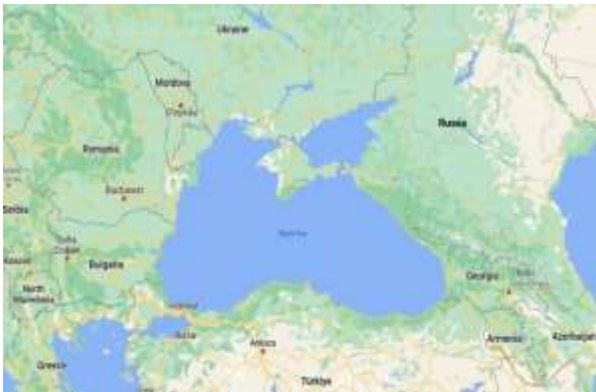


Fig. 1. Countries in the Black Sea Basin
Source: [6].

Currently, the Extended Black Sea area is of major importance both for the main actors in the region as well as for the international ones, as this area represents an important pole from several points of view, geoeconomic, geostrategic and geopolitical [4]. Thus, the cities and villages in the Black Sea region have an important role in the development of the economy of the riparian states, by carrying out activities in areas such as tourism, construction, water transport, extraction of marine resources, trade [16]. The Black Sea Region, due to its strategic location, is an important area not only for cereal production, but also for the supply of raw materials, especially for the less developed regions, as well as for the world grain trade [9]. The existence of several ports along the Black Sea coast, on the Danube River and on the important rivers in the region are facilities for international trade [2, 17]. It should be noted that this activity was flourishing since the time of the Geto - Dacians, who cultivated grain and traded by sea [10].

Today, the change of consumer preferences, rising incomes and technological progress have led to a reshaping of the global food trade, and especially of the wheat market. This aspect is evidenced by two representative trends as follows:

1) the Euronext futures market, which highlights the important elements related to the demand and supply in the EU and the Black Sea Region has become important in terms of the international price of wheat;

2) the growing demand for wheat coming from Asia and Africa is largely covered by the EU and the Black Sea Region [1].

According to specialty studies, over the past two decades, Ukraine and Russia have become world leaders in grain production [15].

The Black Sea Region is a key hub for wheat and maize exports. Wheat exporters from this area, together with the leader represented by Russia, dominated Egypt's wheat imports in the analysed period [7]. The paper presents the competitors from the Black Sea basin, but also Romania's position in the region and in the world grain trade. Romania's position is not determined only by the need to ensure the food security of the population. Tradition and experience testify Romania's vocation as a country with a predominantly cereal agriculture, which has always been in the group of exporters, and its place among producers with a share in the world's cereal production is also determined by the natural conditions favourable to this group of agricultural crops.

MATERIALS AND METHODS

In this article we compared the evolution of corn and wheat areas and productions, as well as the trade with cereals corresponding to the countries of the area related to the Black Sea basin (Romania, Bulgaria, Turkey, Georgia, Russia, Ukraine, Republic of Moldova, Armenia, Azerbaijan and Greece).

The period studied was 2015–2021, and the indicators analysed were: the areas cultivated with corn and wheat, the yields obtained for the 2 types of cereals and the value exports and imports of corn and wheat. The indicators were processed based on statistical data obtained from the Faostat website, Eurostat and the International Trade Centre (ITC) and were presented in tabular and graphical form. Thus, the position of Romania on the cereals market was highlighted.

RESULTS AND DISCUSSIONS

According to data provided by Faostat, in the top 10 maize producers worldwide, ranking

based on the average production achieved between 2015-2021, USA, China and Brazil ranked first. Ukraine ranked 5th, with an average of 31,450,317.14 tons of corn, and the Russian Federation ranked 10th, with 13,783,347.43 tons of corn.

The first three countries in the top 10 wheat producers where China, India and the Russian Federation. The latter obtained an average wheat production in 2015-2021 of 75,668,063.56 tons. Ukraine was the 7th largest producer of wheat in the world, thanks to the 26,994,097.14 tons, the average of wheat production for the 7 years in the study period [5].

Given these data, it will come as no surprise that these two states are ranked at the top of maize and wheat producers in the area adjacent to the Black Sea Basin.

Figure 2 shows the areas that were cultivated with maize in the Black Sea Basin area in the period 2015-2021.

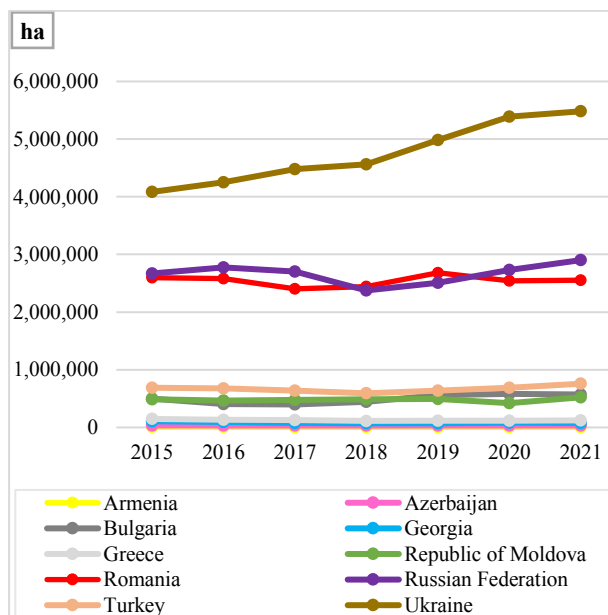


Fig. 2. Area cultivated with maize in the states of the Black Sea Basin, in the period 2015-2021
 Source: own design after [5].

The presence of Ukraine on the first places stands out, with 5,481,800 ha in 2021, followed by the Russian Federation – 2,901,612 ha and Romania – 2,554,680 ha. It is worth noting that Ukraine has cultivated an area almost double compared to the next ranked, the Russian Federation. If for Romania we recorded a decrease in the area

cultivated with maize by 1.69% in 2021 compared to 2015, for the first 2 ranked states there were increases by 34.24% for Ukraine (the highest growth percentage in the analysed area) and by 8.67% for the Russian Federation.

Other important growers in the area were Turkey – 758,032 ha, Bulgaria – 573,020 ha and the Republic of Moldova – 522,300 ha. The smallest areas were found in Greece, Georgia, Azerbaijan and Armenia. The largest decrease in corn areas was recorded by Armenia, by 65.94%.

Corresponding to the cultivated area, Ukraine was the largest maize producer in the Black Sea Basin area, achieving a production of 42,109,850 tons in 2021 (Figure 3) and an increase in production in the period 2015-2021 by 80.52%. The second and third places in the ranking were occupied by the Russian Federation – 15,239,865 tons and Romania – 14,820,690 tons.

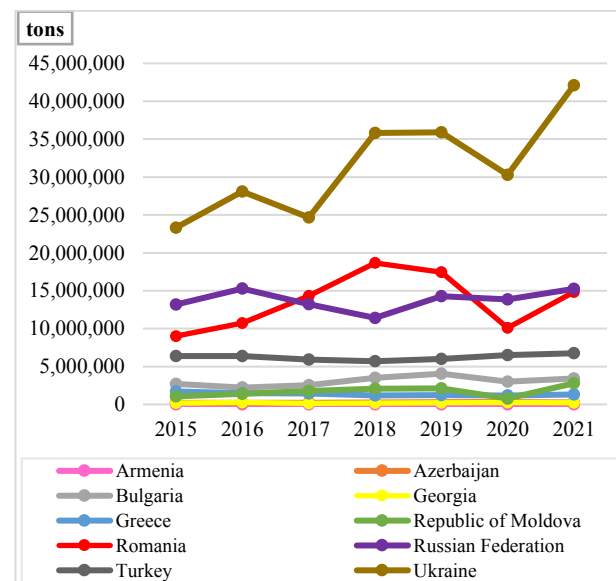


Fig. 3. Production of maize obtained in the states of the Black Sea Basin in the period 2015-2021
 Source: own design after [5].

It should be specified that, as in the case of corn-grown areas, the outputs obtained by the two states fluctuated, so that there were years when Romania cultivated or produced more corn than the Russian Federation. It is worth noting that Ukraine has achieved a production almost triple compared to the next ranked, the Russian Federation.

Romania was in a leading position (2nd place) also in the top corn producers in the EU, where the first place was held by France [3]. Of the states under analysis, small maize yields were obtained by Azerbaijan, Georgia and Armenia.

Despite the problems caused by the Covid pandemic, the states in the Black Sea Basin area have recorded, except for Greece and Armenia, increases in maize production. Thus, the Republic of Moldova registered the highest percentage of growth, 159.36%, and Armenia the highest decrease, 72.38%. Romania had a 64.28% increase in maize production between 2015-2021.

The largest wheat grower in the analysed area was the Russian Federation, with 27,916,725 ha in 2021, about 4 times more than the next ranked, Ukraine – 7,099,400 ha (Figure 4).

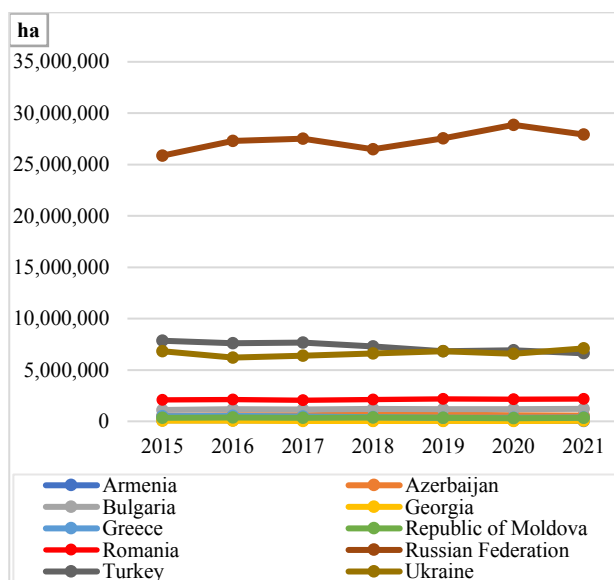


Fig. 4. Area cultivated with wheat in the states of the Black Sea Basin in the period 2015-2021

Source: own design after [5].

It was followed on the 3rd place by Turkey – 6,623,061 ha, and Romania was on the 4th place, cultivating 2,175,080 ha. Under 1,000,000 ha cultivated with wheat were found in Azerbaijan, Greece and the Republic of Moldova. In Georgia and Armenia wheat was encountered on the smallest areas of the Black Sea Basin - 50,300 ha, respectively 39,288 ha. The largest increase in wheat-grown areas for the period 2015-2021 was recorded in Bulgaria, with 9.07%, and the

largest decrease was recorded in Armenia, 63.78%. Romania had an increase of 3.45%.

Figure 5 shows the evolution of wheat production in the period 2015-2021, in the 10 states of the Black Sea Basin area. The Russian Federation was the largest wheat producer, achieving a production of 76,057,258 tons in 2021 and an increase in production in the period 2015-2021 by 23.10%.

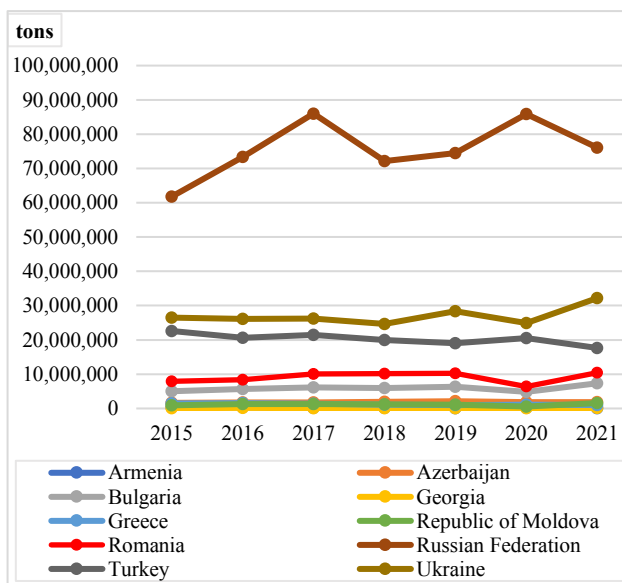


Fig. 5. Production of wheat obtained in the states of the Black Sea Basin, in the period 2015-2021

Source: own design after [5].

On the following places were Ukraine – 32,183,300 tons and Turkey – 17,650,000 tons. It is worth noting that the Russian Federation has achieved a production double compared to the next ranked. Romania was the 4th wheat producer, with 10,433,750 tons in 2021 and an increase compared to 2015 of 31.04%.

Also, Romania took the 4th place in the list of wheat producers in the EU, after France, Germany and Poland [3].

Bulgaria was also an important wheat producer in the analysed area, harvesting 7,343,990 tons in 2021, but instead small wheat productions were obtained in Georgia – 135,900 tons and Armenia – 97,000 tons.

With a few exceptions (Turkey, Greece and Armenia), the countries in the Black Sea Basin Region recorded increases in wheat production between 2015 and 2021. Thus, the Republic of Moldova registered the highest

percentage of growth, 69.71%, and Armenia the highest decrease, 73.26%.

The value exports of corn worldwide, presented in Table 1, indicate that three of the 10 countries in the Black Sea basin area were in the top 10, at the level of 2021. It is Ukraine (3rd place - 5,854,587 thousand \$), Romania (6th place - 1,936,164 thousand \$) and the Russian Federation (10th place - 694,207 thousand \$), the first place being held by the USA. The places occupied by the other analysed countries are shown in the table

below and it can be seen that Azerbaijan, Georgia and especially Armenia were not major players in the corn trade. The states in the Black Sea basin area generally recorded increases in the value of maize exports in the period 2017-2021, with the exception of the Russian Federation and Greece. The largest increase in value was recorded for Turkey (270.70%), and the largest decrease was for the Russian Federation, 21.74%. Romania doubled the value of its exports during the analysed period (234.35%).

Table 1. The position occupied by the states in the Black Sea Basin in the ranking of global maize exporters -1,000 \$

Place	Exporters	2017	2018	2019	2020	2021	2021/2017 %
1	United States of America	9,578,197	12,916,097	8,061,803	9,575,477	19,112,373	199.54
2	Argentina	3,885,188	4,233,392	5,948,632	6,046,745	9,064,172	233.30
3	Ukraine	2,989,133	3,506,065	5,218,275	4,883,689	5,854,587	195.86
4	Brazil	4,631,046	4,109,859	7,421,383	5,853,003	4,188,846	90.45
5	France	1,454,163	1,670,170	1,371,812	1,719,245	1,937,359	133.23
6	Romania	826,180	1,026,597	1,390,729	1,225,773	1,936,164	234.35
7	Hungary	908,309	771,325	860,304	1,015,880	1,045,652	115.12
8	India	157,552	254,688	143,858	389,280	935,608	593.84
9	South Africa	474,080	456,038	281,052	564,615	809,266	170.70
10	Russian Federation	887,036	854,371	616,676	395,244	694,207	78.26
15	Bulgaria	184,141	269,597	465,587	503,542	486,382	264.14
22	Turkey	53,038	43,878	173,324	121,037	143,575	270.70
23	Republic of Moldova	53,655	109,929	125,150	79,545	127,207	237.08
56	Greece	6,370	4,905	4,112	5,526	5,718	89.76
69	Azerbaijan	0	50	8	0	2,630	0.00
78	Georgia	608	610	967	622	967	159.05
143	Armenia	0	0	0	0	1	0.00

Source: Own calculation after [8].

Table 2. The position occupied by the states in the Black Sea Basin in the ranking of wheat exporters worldwide, 1,000 \$

Place	Exporters	2017	2018	2019	2020	2021	2021/2017 %
1	Russian Federation	5,791,013	8,432,493	6,399,310	7,918,294	7,301,689	126.09
2	United States of America	6,093,290	5,456,303	6,278,593	6,322,649	7,286,648	119.58
3	Australia	4,674,071	3,082,017	2,514,432	2,712,736	7,247,149	155.05
4	Canada	5,091,888	5,711,364	5,385,361	6,301,250	6,639,162	130.39
5	Ukraine	2,759,757	3,004,359	3,658,402	3,595,472	4,722,745	171.13
6	France	2,993,366	4,124,151	4,355,355	4,540,749	4,550,825	152.03
7	Argentina	2,362,463	2,418,449	2,295,535	2,029,494	2,973,036	125.84
8	Germany	1,595,492	1,163,946	1,254,530	2,103,668	1,982,255	124.24
9	Romania	1,129,408	1,223,154	1,272,159	948,815	1,820,092	161.15
10	India	55,233	46,642	54,009	243,067	1,723,431	3,120.29
12	Bulgaria	777,257	865,695	947,262	700,292	1,372,280	176.55
24	Greece	53,593	87,176	76,505	89,206	209,095	390.15
25	Republic of Moldova	105,238	93,831	97,645	27,494	207,713	197.37
33	Turkey	14,828	23,906	48,212	39,492	97,828	659.75
58	Armenia	18	5	11	30	592	3,288.89
62	Georgia	2,260	2,154	877	13	393	17.39
119	Azerbaijan	0	0	315	0	0	0.00

Source: Own calculation after [8].

Global wheat exports by value, shown in Table 2, are dominated in 2021 by the Russian Federation (7,301,689 thousand \$), the third world wheat producer and the first in the Black Sea basin area. Ukraine (5th place - 4,722,745 thousand \$) and Romania (9th place - 1,820,092 thousand \$) are also present in the top 10. Bulgaria was in 12th place, with 1,372,280 thousand \$, a better position than the one held in terms of value exports of corn. It can be seen that Armenia, Georgia and Azerbaijan are not major players in the wheat trade.

All states in the area related to the Black Sea basin recorded increases in the value of wheat exports in the period 2017-2021. With the exception of Armenia, for Greece the highest increase was recorded (390.15%). In the same period, Romania recorded an increase in value exports by 161.15%.

Table 3 shows the value of corn imports of the 10 states in the area related to the Black Sea basin. They are not in the top corn importers, and in Table 3 the positioning was done according to the values related to 2021. It can be seen that Turkey was in the first place, with 680,343 thousand \$, and the lowest values for corn imports have been registered by Azerbaijan, 11,852 thousand \$.

Increases in the value of maize imports were recorded by Turkey, Romania, Greece, Georgia, the Republic of Moldova and Armenia, and decreases were recorded by the Russian Federation, Ukraine, Bulgaria and Azerbaijan. The largest increase in value was recorded for Romania (252.68%), and the largest decrease was for the Russian Federation, 39.15%.

Table 3. Imports of maize from states in the Black Sea Basin area, 1,000 \$

Importers	2017	2018	2019	2020	2021	2021/2017 %
Turkey	425,673	438,015	847,519	485,439	680,343	159.83
Romania	142,967	145,576	192,254	363,961	361,254	252.68
Greece	152,907	170,061	161,798	155,620	200,829	131.34
Russian Federation	182,271	156,413	108,203	132,704	110,914	60.85
Ukraine	132,015	142,703	133,042	105,443	89,451	67.76
Bulgaria	101,187	42,731	50,104	56,590	74,539	73.66
Georgia	15,998	21,466	18,391	24,079	21,397	133.75
Republic of Moldova	10,119	14,618	15,866	25,023	18,639	184.20
Armenia	7,877	11,745	12,091	13,241	14,046	178.32
Azerbaijan	19,242	12,143	18,435	14,158	11,852	61.59

Source: Own calculation after [8].

Table 4. Imports of wheat for the states in the Black Sea Basin area, 1,000 \$

Importers	2017	2018	2019	2020	2021	2021/2017 %
Turkey	1,043,327	1,289,234	2,303,139	2,334,510	2,692,623	258.08
Azerbaijan	227,168	205,968	340,537	296,905	331,946	146.12
Greece	243,100	251,020	237,894	210,959	311,942	128.32
Romania	229,155	136,169	177,125	254,430	257,186	112.23
Georgia	110,639	149,854	105,082	111,864	93,442	84.46
Armenia	60,544	62,858	50,851	72,416	62,383	103.04
Russian Federation	39,709	60,466	46,768	64,839	49,158	123.80
Bulgaria	15,319	14,583	14,469	9,425	18,859	123.11
Ukraine	3,032	2,806	1,947	3,645	5,388	177.70
Republic of Moldova	748	888	570	1,041	1,080	144.39

Source: Own calculation after [8].

Table 4 shows the value of wheat imports from the Black Sea Basin region for the 10 analysed states. With the exception of Turkey (4th position in the top world wheat importers - by value), they did not rank among the main

wheat importing countries, and the ranking in Table 4 is based on the relevant values in 2021. It can be seen that Turkey occupied the first place with 2,692,623 thousand \$, and the

lowest value was for the imports of the Republic of Moldova, 1,080 thousand \$.

Wheat imports increased in all of the above states except Georgia. Turkey had the highest increase (258.08%) and Georgia had a decrease of 15.54%.

Compared to 2015, Romania's wheat import values increased by 112.23%.

CONCLUSIONS

The existing pedoclimatic conditions in the area related to the Black Sea basin have favoured the cultivation of cereals in these lands, since ancient times,

Currently, some of the world's leading corn and wheat growers, producers and exporters, Ukraine, the Russian Federation and Romania, come from this area.

Following the analysis of the data presented in the paper, the following conclusions were drawn:

-The most important corn growers in 2021 were Ukraine (5,448,180 ha), the Russian Federation (2,901,612 ha) and Romania (2,554,680 ha); the productions obtained were as follows: Ukraine - 42,109,850 tons, Russian Federation - 186,529 tons and Romania - 14,820,690 tons;

-The first three wheat growers in the analysed area, in 2021, were the Russian Federation (27,916,725 ha), Ukraine (7,099,400 ha) and Turkey (6,623,061 ha); the following productions were obtained: Russian Federation - 76,057,258 tons, Ukraine - 32,183,300 tons and Turkey - 17,650,000 tons;

-There were three countries from the Black Sea region in the world ranking according to the values of corn exports: Ukraine (3rd place - 5,854,587 thousand \$), Romania (6th place - 1,936,164 thousand \$) and the Russian Federation (10th place - 694,207 thousand \$) in 2021;

-Worldwide wheat exports in value were dominated in 2021 by the Russian Federation (7,301,689 thousand \$), Ukraine (5th place - 4,722,745 thousand \$) and Romania (9th place - 1,820,092 thousand \$);

-The states in the area related to the Black Sea basin did not represent important importers on

the grain market, but among them Turkey was the main importer of corn at the regional level, with an import value of 680,343 thousand \$ and at the same time it occupied the 4th place in the list of importers of wheat worldwide with 2,692,623 thousand \$ in 2021;

-For Romania, in the period 2015-2021, an increase was noted, both in the value of corn and wheat exports, and in imports.

ACKNOWLEDGEMENTS

This work was supported by a grant of the University of Agronomic Sciences and Veterinary Medicine of Bucharest Project number 1060/15.06.2022, "Propuneri de măsuri strategice în agricultura din România în contextul instabilității geopolitice / Proposals for strategic measures in Romanian agriculture in the context of geopolitical instability", Acronym AgRoMaS, within IPC 2022; co-financier PRO-AGRO Federation.

REFERENCES

- [1] Ahmed, O., Glauben, T., Heigermoser, M., Prehn, S., 2021, With great power comes great responsibility: The EU and the Black Sea Region take leadership of the global wheat market, IAMO Policy Brief, No. 41e, <https://nbn-resolving.de/urn:nbn:de:gbv:3:2-139998>, Accessed on 10 January 2023.
- [2] Bosneagu, R., 2022, The Historical, Social, Political, Economic, and Geopolitical Framework of the Black Sea Basin Influencing Maritime Transportation. The Black Sea from Paleogeography to Modern Navigation. Springer, Cham., https://doi.org/10.1007/978-3-030-88762-9_10.
- [3] Chiurciu, I.A., Certan, I., Dinu, T.A., Soare, E., Stoicea, P., 2022, The contribution of the member states to the consolidation of the EU's role on the cereals market, in the context of the current geopolitical instability. In: Creșterea economică în condițiile globalizării (Economic growth in conditions of globalization), 16th Edition, Vol.1, 12-13 October 2022, Chișinău. Moldova, INCE, 2022, 308-317, https://ibn.idsi.md/vizualizare_articol/170675, Accessed on 10 January 2023.
- [4] Crenganiș, A.M., Spațiul Extins al Mării Negre, scurt tablou descriptiv (Extended Black Sea region, short descriptive picture). Casa Mării Negre (Black Sea House), <https://www.casamariinegre.ro/studii/geopolitica/104/spatiul-extins-al-marii-negre-scurt-tablou-descriptiv>, Accessed on 12.12.2022.

- [5]Faostat–Food and Agriculture Organization of the United Nations. 2022, <https://www.fao.org/faostat/en/#data/QCL>, Accessed on 9.01.2022.
- [6]Google Maps, 2023, <https://www.google.co.uk/maps/@43.7427554,32.3681142,5.66z>, Accessed on 15.01.2023.
- [7]Heigermoser, M., Götz, L., Svanidze, M., 2021, Price formation within Egypt's wheat tender market: Implications for Black Sea exporters. *Agricultural Economics*, 52, 819–831, <https://doi.org/10.1111/agec.12656>.
- [8]ITC - International Trade Centre, 2023, <https://intracen.org/resources/data-and-analysis/trade-statistics>, Accessed on 11.01.2023.
- [9]Ivanova, D., 2021, Challenges for the Wheat Market in the Black Sea Region under Covid-19. *Agribusiness and Rural Areas - Economy, Innovation and Growth, 2021 Conference Proceedings*, University publishing house "Science and Economics", University of Economics - Varna, Issue 1, 144-151, DOI: 10.36997/ARA2021.144.
- [10]Popescu, A., 2018, Maize and Wheat - Top agricultural products produced, exported and imported by Romania. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development"*, Vol. 18(3), 339-352.
- [11]Programul Interreg VI-B NEXT Bazinul Mării Negre (The Program Interreg VI-B NEXT Black Sea Basin), 2022. [Fonduri-structurale.ro](https://www.fonduri-structurale.ro), <https://www.fonduri-structurale.ro/program-operational/51/next-bazinul-marii-negre>, Accessed on 15.12.2022.
- [12]Schileru, I., 2016, Ce trebuie să știm despre cereale. *Cerealele integrale versus cerealele rafinate (What we need to know about cereals. Whole grains versus refined grains.)*. Asociația Pro Consumatori Romania (Pro Consumers Association Romania), <https://www.apc-romania.ro/ro/i-ce-trebuie-sa-stim-despre-cereale-cerealele-integrale-versus-cerealele-rafinate/MzMzLTA.html>, Accessed on 10.01.2023.
- [13]Soare, E., Chiurciu, I.A., Bălan, A., David, L., 2018, World Market Research on Maize. *Agriculture for Life, Life for Agriculture Conference Proceedings*, 1, 216 - 222.
- [14]Soare, E., Chiurciu, I.A. 2016, Research on the Romanian wheat market. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development"*, Vol. 16(2), 287-292.
- [15]Svanidze, M., Đurić I., 2021, Global Wheat Market Dynamics: What Is the Role of the EU and the Black Sea Wheat Exporters? *Agriculture* 11, 8, 799, <https://doi.org/10.3390/agriculture11080799>.
- [16]Tonev, M., 2021, Ecological aspects of the economic development of the Black Sea Region of the Republic of Bulgaria. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development"*, Vol. 21(2), 653-660.
- [17]Voicilaș, D.M., Kalaman, O., 2020, Cereal Market In The Black Sea Region – Comparative Analysis For Romania And Ukraine. *Agricultural Economics and Rural Development, Institute of Agricultural Economics*, Vol. 17(2), 183-198, http://www.eadr.ro/RePEc/iag/iag_pdf/AERD2002_183-198.pdf, Accessed on 10 January 2023.