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RESEARCH ON WORLDWIDE SORGHUM PRODUCTION AND TRADE FOR THE PERIOD 2017-2022

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Abstract

This research reflects a number of aspects regarding the production and trade of sorghum worldwide, in the period 2017-2022. In the paper, several indicators specific to the sorghum production and marketing sector were highlighted and analysed, such as: cultivated area, production, average production and average annual consumption of sorghum and sorghum products per capita; imports and exports. Sorghum ranks 5th in the top of the most cultivated cereals worldwide. Sorghum is cultivated on all continents but the areas occupied vary widely from one region to another. In 2022, Africa accounted for 51.3% of the world's sorghum production. The production of sorghum has a number of uses such as: feeding the population; animal feed and as raw material for industry. The statistical data used in this research were provided by the FAOSTAT website.

***Key words**: sorghum, cultivated surface, average production per hectare, total production, imports and exports at the global level*

INTRODUCTION

Sorghum is an herbaceous species that is very similar to corn. It is a cereal that belongs to the Poaceae family and is native to Africa [12].

According to specialists, sorghum and corn have a common ancestor due to polyploidization but also repetitive DNA propagation [8].

Sorghum ranks 5th in the ranking of cereals cultivated worldwide [1]. This situation is due to several factors, the most representative of which are: increased resistance to drought; low production costs; short growing season; increasing interest of farmers worldwide in this crop etc. [2, 5, 6].

Currently, sorghum is cultivated in over 100 countries on all continents, but the largest cultivated areas are found in Africa and Asia [6, 10, 12]. However, there is a decrease in the cultivated areas, as well as the stagnation of the yield per hectare due to changes in the agricultural policy [3].

It should be noted that, due to climate change and its negative impact on representative crops, many farmers are switching to replacing corn with sorghum, which is much more resistant to drought [9].

Sorghum cultivation is of particular importance, as it has many uses, such as: raw material used in the food industry; animal feed; biomass for biofuels; it contributes to the maintenance of biodiversity etc. [7, 9, 13].

In Asia, the use of sorghum as a staple food crop has been found to be declining, as consumption shifts to rice and wheat [11].

Sorghum is a whole grain with numerous nutritional benefits. It is also rich in bioactive polyphenols and other beneficial compounds that have a positive impact on people's health [16].

For developed regions, sorghum was one of the most important sources of feed, but also an important raw material for alcohol and starch [17].

Scientists foresee the potential of sorghum as a staple food in the future, as humanity will be

subject to the negative impact of climate change, and it is more resistant to drought [2].
As regards the global production and consumption of sorghum, it has been observed that there have been no major changes, but there is nevertheless a change in them at continental and regional level [15].

Currently, the largest sorghum producers registered worldwide are: Nigeria; Sudan; United States of America, Mexico, Ethiopia, India, China, Brazil, Argentina and Australia [4, 6].

Sorghum is a competitive crop, especially when the cultivation technology is respected.

In this context, the research aimed to analyse a series of aspects related to the production and trade of sorghum worldwide in the period 2017-2022.

MATERIALS AND METHODS

The most representative indicators were presented and analysed in the paper, as it follows: the area cultivated with sorghum worldwide; global sorghum production; the average production per hectare of sorghum registered worldwide; imports and exports of sorghum worldwide.
The Faostat website was the most important provider of statistical data that contributed to the realization of this research.
Numerous specialized materials were also consulted.
In the paper, the results of the research were presented in a graphic form.

RESULTS AND DISCUSSIONS

Between 2017 and 2022, numerous changes in sorghum production and trade were observed worldwide. As for the area cultivated with sorghum, it was found that it varied from one year to another.
According to the statistical data obtained from Faostat, it can be seen that, in 2018, the largest area with sorghum in the world was cultivated, of 42,040,377 ha.
In 2019, the smallest sorghum area of 39,201,095 ha was cultivated globally.
The area cultivated with sorghum worldwide decreased slightly in 2022, by 0.90% compared to 2022 (Fig.1).

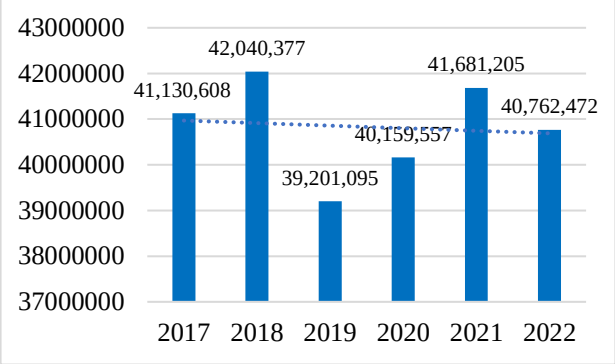

Fig. 1. Area cultivated with sorghum worldwide, in the period 2017-2022 (ha)
Source: Own design based on FAOSTAT database 2024 [4].

During the period under review, global sorghum production recorded different levels According to data on sorghum production at global level, it was found that the highest production was registered in 2021 (62.1 million tons).
The lowest sorghum production obtained worldwide was of 56.7 million tons in 2019 (Figure 2).

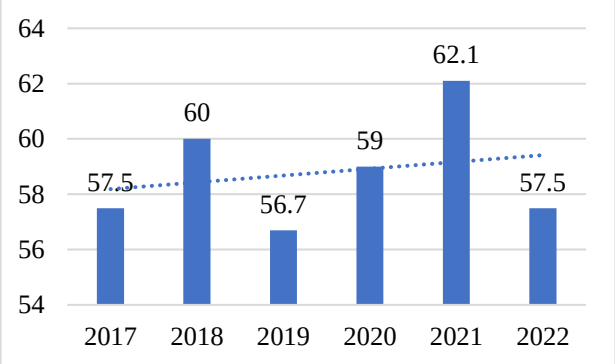

Fig. 2. Total global sorghum production for the period 2017-2022 (million tons)
Source: Graph made based on data processed after Faostat [4].

In 2019, it was found a close correlation between the area cultivated with sorghum worldwide and the total sorghum production achieved. In 2022, sorghum production remained constant, compared to 2017, but different from a region to another.
These differences in production are due to several factors, including: cultivated area;

yield per hectare; soil and climate conditions; the cost of production; demand level etc.

In 2022, the regional distribution of global sorghum production is shown in Figure 3.

America with a production of 16,373,192.98 tons (28.4% of world sorghum production), was in 2nd place.

Asia, with a production of 8,268,164.04 tons (14.4% of the world production of sorghum), ranks 3rd.

Oceania, with a production of 2,652,953.79 tons (4.6% of world sorghum production), was in 4th place.

Europe with a production of 724,234.13 tons (1.3% of the world production of sorghum), ranks 5th in this hierarchy.

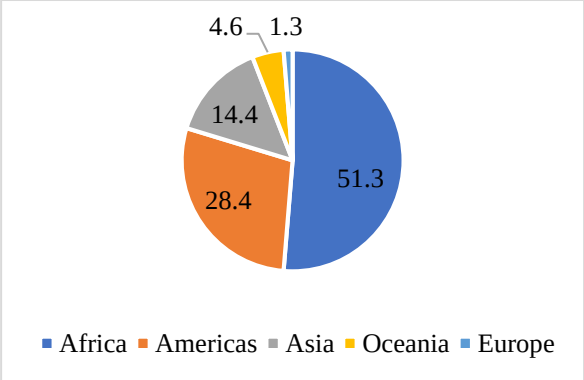

Fig. 3. Share of sorghum production at regional level in 2022 (%)
Source: Own design based on FAOSTAT database 2024 [4].

In 2022, according to statistical data published by Faostat, the top five major sorghum producers registered worldwide were:Nigeria (6,806,370 tons);Sudan (5,248,000 tons);United States of America (4,769,960 tons);Mexico (4,754,169.1 tons);Ethiopia (4,200,000 tons) [4].

The average sorghum production per hectare achieved worldwide has changed from one year to another in the analysed interval.

From the data presented in Figure 4, it can be seen that the highest average production per hectare of sorghum was 1,490.4 kg/ha (2021), and the lowest was in 2017 (1,398.8 kg/ka). In 2022, the average sorghum production per hectare worldwide increased by only 0.98%, compared to 2017.

According to specialists in the field, the yield recorded for sorghum cultivation worldwide during the analysed period was much lower, far below its potential. Under normal conditions, when using improved varieties, yields of 5.0-6.0 tons/hectare can be easily achieved [5].

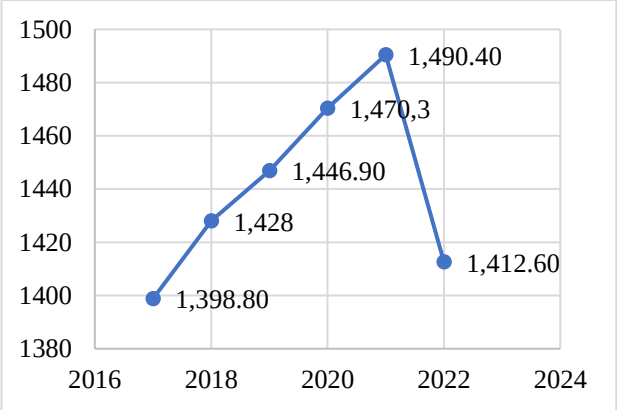

Fig. 4. Average sorghum production per hectare worldwide, in the period 2017-2022 (kg/ha)
Source: Processing and own design based on FAOSTAT database 2024 [4].

Between 2017 and 2022, the average annual consumption per capita of sorghum and sorghum products changed.

The consumption of 4.0 kg/capita in 2022 represented the maximum, and that of 3.49 kg/capita (2019) was the lowest (Figure 5).

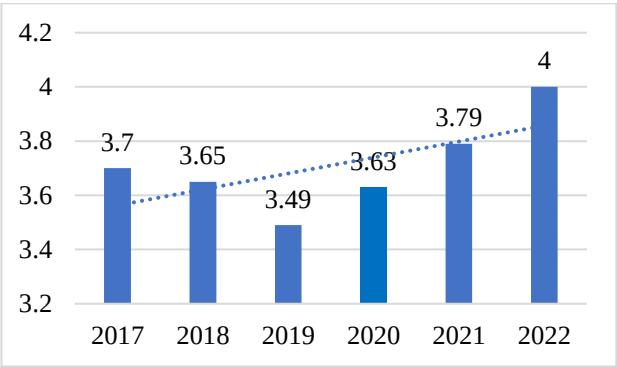

Fig. 5. Average annual consumption of sorghum and sorghum products per capita worldwide, 2017-2022 (kg/capita)
Source: FAOSTAT, 2024 [4].

In 2022, regarding the consumption of sorghum and sorghum products, it was found to have increased by 8.10%, compared to 2017.

This increase is due to several factors, including: the price level and the beneficial effects on food security.

At the global level, about 500 million people from more than 30 countries especially from Africa and China eat sorghum.
Quantitative exports of sorghum and sorghum products globally have changed from one year to the next (Figure 6). In 2021, the quantitative exports of sorghum and sorghum products of 10,955 thousand tons were the highest in the analyzed period. At the opposite pole, the lowest exports were in 2019 (3,919 thousand tons).

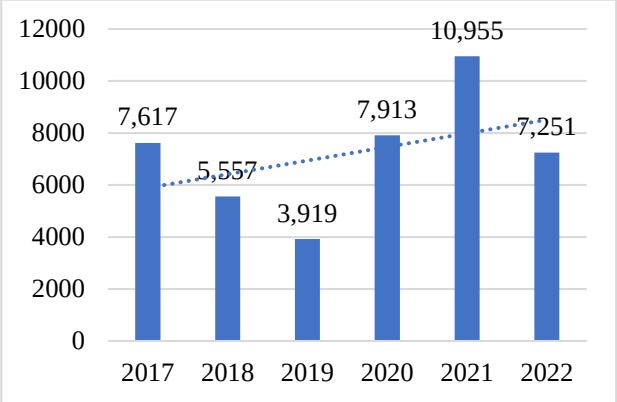

Fig. 6. Global exports of sorghum and sorghum products, 2017-2022 (thousand tonnes)
Source: FAOSTAT, 2024 [4].

Quantitative exports of sorghum and sorghum products worldwide in 2022 decreased by 4.81%, compared to 2017.
In 2022, according to data published by Faostat, the top 5 sorghum exporters that stood out worldwide are:United States of America (6,206,369 tons);Australia (2,212,137 tons);Argentina (1,689,245 tons);France (149,653.2 tons);Ukraine (72,421.6 tons) [3].
Regarding the quantitative imports of sorghum and sorghum products, the data presented show that there were variations from one year to another (Figure 7).
Regarding imports of sorghum and sorghum products globally, the highest were in 2022 (12,024 thousand tons).
In 2019, the lowest imports of only 3,717 thousand tons were observed. Quantitative imports of sorghum and sorghum products made on the international market increased by 56.6% in 2022, compared to 2017.

According to the statistical data published by Faostat for 2022, it was observed that the first major importers of sorghum registered worldwide were the following:China (10,140,198 tons);Japan (265,411 tons);Mexico (230,862.5 tons);Spain (223,418.6 tons);Sudan (122,741 tons) [3].

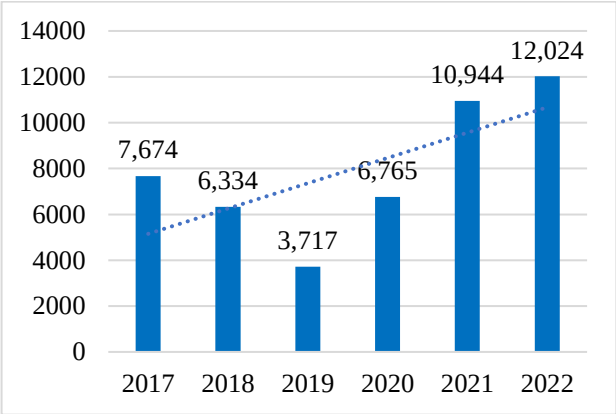

Fig. 8. Global imports of sorghum and sorghum products, 2017-2022 (thousand tonnes)
Source: FAOSTAT, 2024 [4].

According to specialists in the field, an increase in the sorghum market is expected. In perspective, the growth of the global sorghum market will be based on its three-dimensional aspect:

- food for part of the population;
- source for biofuels;
- nutritional component for animal feed.

Sorghum will keep its place on the international market because, on the one hand, it meets the needs of those interested in health (it does not contain gluten), and on the other hand, it can face the challenges related to climate change [6, 14].

CONCLUSIONS

Following the analysis of the most significant indicators related to the production and trade of sorghum worldwide for the period 2017-2022, the following aspects were highlighted:
-The largest area cultivated with sorghum was of 42,040,377 ha (2018);
-In 2021, the most substantial sorghum production of 62.1 million tons was achieved;
-At the level of 2022, Africa obtained the highest sorghum production at the continental

level, being the leader of the ranking with 29,565,397.84 tons;
-In 2021, the highest average production per hectare of sorghum was 1,490.4 kg/ha;
-The highest average annual consumption per capita of sorghum and sorghum products was in 2022 (4.0 kg/capita);
-In 2021, the largest exports of sorghum and sorghum products of 10,955 thousand tons were highlighted;
-In 2022, the largest amount of sorghum on the international market was exported by the United States of America (6,206,369 tons);
−The largest imports of sorghum and sorghum products were 12,024 thousand tons (2022);
-In the year 2022, China was the largest importer of sorghum with 10,140,198 tons.
By 2030, the sorghum production and marketing sector is expected to grow worldwide, on the one hand, due to population growth, and on the other hand, due to its use in different fields of activity.

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