

## IMPACT OF THE WAR ON THE EXPORT OF UKRAINIAN ORGANIC AGRICULTURAL PRODUCTS

\*Natalya Sirenko , Alla Burkovska , Olha Melnyk , Olena Bodnar , Kateryna Mikulyak 

Mykolayiv National Agrarian University, Ukraine

\*Corresponding author's email: mikulyak@mnaeu.edu.ua

### Abstract

One of the promising areas of creating a competitive market environment is the development of organic production. Under martial law, organic producers faced not only problems related to the export of organic products, but also other challenges caused by the military actions of the aggressor. The purpose of the study is to assess the impact of the war on the export of organic products by domestic agricultural enterprises. The article reveals the general state and changes in the dynamics of export of organic agricultural products by domestic organic producers; the challenges faced by producers of organic products in the conditions of martial law are presented; the impact of the war on the export of organic agricultural products by producers of organic products is determined; the forecast of the value of agricultural products exported by Ukraine for the period until 2025 was made (with the help of retrospective and statistical research methods); directions for supporting exporters of organic products for their development in the future are given. As a result of the authors' research, it should be noted that export operations of organic products will increase, which will allow to ensure the strategic goals of Ukraine regarding development in the market environment.

**Key words:** war, export, foreign market, organic agricultural products, market environment.

### Introduction

Ukraine has significant potential in the field of organic production and is one of the leaders in the volume of exports of organic products. The full-scale war in Ukraine affected the ability of business entities to carry out their activities, expand exports and overcome logistical difficulties. In today's conditions, not only the growth of the export of raw materials, but also of organic products with a high added value is gaining importance.

The purpose of the study is to assess the impact of the war on the export of Ukrainian organic agricultural products and to determine the strategic guidelines for the development of organic exports.

The goals of the study are:

1. To reveal the general state and dynamics of changes in the export of organic agricultural products by domestic organic producers.
2. To present the challenges faced by producers of organic agricultural products in the conditions of military aggression.
3. To determine the impact of the war on the export of organic agricultural products by producers of organic products.
4. To make a forecast of the value of agricultural products exported by Ukraine for the period until 2025.

#### *Organic agriculture – marketing opportunities*

Responding to the International Federation of Organic Agricultural Movement (IFOAM) definition, 'Organic agriculture is a production system that supports healthy soils, ecosystems and people'. Organic agriculture is based on ecological processes, biological diversity and natural cycles, while minimizing the use of harmful pesticides that have a negative impact on the environment.

Gulieva K. within the framework of the project 'German-Ukrainian cooperation in the field of organic agriculture' researched the development, status quo before the war, the current state and marketing

opportunities of organic agriculture in Ukraine. Thus, as of July 2022, about 20% of the territories of Ukraine, including some organic fields and objects of organic production, remained occupied by the Russian Federation. According to the results of the survey, which was conducted from July 6 to 15, 2022 by the association 'Organic Initiative' and the public union 'Organic Ukraine' in order to analyse the situation in the agricultural sector in the 5th month of the war, as well as the plans of market operators for the new marketing season regarding the needs/problems of selling organic products in the 2022/2023 marketing season, it was determined that 69.0% of respondents considered the problem to be low purchasing power, 56.0% – a decrease in demand for organic products, 51.0% – disruption of supply chains, 43.0% – problems with the sale of organic products, 22.0% considered access to production facilities a need, 14% – marketing tools.

The key challenges of exporting organic products from Ukraine were logistics: blocked ports, insufficient amount of transport, fuel (shortage and increase in fuel prices), drivers (lack of drivers of non-drafting age), destroyed infrastructure, lack of flights.

A survey on the situation at the enterprises of organic producers in the 5th month of the full-scale war shows that 44.0% of respondents continued to work; 24.0% – production was partially stopped, but work continued; 13.0% – the enterprise (land, production facilities, etc.) suffered from the occupation from direct hits, but production resumed; 10.0% – production was stopped for other reasons, but work resumed; 5.0% – the enterprise (land, production facilities, etc.) suffered from occupation or from direct strikes and production was stopped; 4.0% – the enterprise (land, production facilities, etc.) was under occupation (Gulieva, 2022). Within the same survey regarding changes in plans for organic production, it was found that 42.0% of organic producers continued organic production/processing in full; 23.0% would like to continue if the financial

component of the enterprise is ensured; 27.0% continued production, but needed a change in marketing and/or sales strategy; 5.0% partially reduced the area under organic production or changed the direction of activity; 3.0% refused organic production during the period of active military operations.

Didovych *et al.* (2023) the necessity of applying risk management tools in organizing the export of Ukrainian organic products is considered. The authors note that in recent years, Ukraine has become an important supplier of organic products to the EU, and despite the full-scale war, in 2022, exports of organic products to EU countries have increased (Didovych *et al.*, 2023).

We agree with the opinion of the authors that clear compliance with the requirements for storage, transportation, processing of organic products and assessment of risks associated with organic products, insurance from the leaders of the freight insurance market, involvement of certification bodies in the certification of products will allow exporters to minimize the likelihood of risks in the process export of organic products.

Koval, Vdovenko, & Zos-Kior (2023) the issue of regulation of rural development for the export of organic agricultural products in the context of the development of international trade and decentralization is investigated. Therefore, the authors in the scientific work note that decentralization can contribute to the development and modernization of the transport infrastructure, which is important for the effective export of agricultural products, and the improvement of the infrastructure ensures fast and uninterrupted movement of goods to international markets (Koval, Vdovenko & Zos-Kior, 2023).

The article 'Participation of International Organizations in Solving the Problems of the Agricultural Sector of Ukraine' analyzes the activities of international organizations in mitigating the problems caused by Russia's military aggression, and also offers scenarios and priorities in solving problems that are important for farming and agribusiness in general (Rajai *et al.*, 2022).

#### *Environmental management of domestic enterprises of organic products*

The hostilities have not only affected the ability of organic producers to export organic products, but also have negative consequences for the ecosystem. Therefore, in today's conditions, agricultural business entities should implement environmental management to reduce their impact on the natural environment. The initiative activity of economic entities (environmental management) is directed to the formation and implementation of environmental policy, aimed at the formation and implementation of environmental policy, management of environmental aspects of activity within the general system of administrative management. We agree with Kundilovska's *et al.* (2019) opinion that the implementation of an

ecological management system at the enterprise allows to increase the level of organicity of the product and achieve the following advantages: reduction of costs associated with the negative impact of enterprises on the environment; the possibility of promoting products and services to international markets; saving raw materials, materials and energy; the possibility of receiving tax benefits; increasing the competitiveness of products; improvement of the company's reputation and formation of a favourable public opinion about the company's activities (Kundilovska *et al.*, 2019).

At the same time, in the work 'Prospects for the Development of Small Agricultural Business Entities in the Market Environment' it is emphasized that the subjects of entrepreneurial activity in order to guarantee the use of modern agricultural technologies, environmentally safe herbicides and pesticides, organic waste in the fields, anti-erosion measures; reduction of emissions into the environment must have a sufficient level of local social responsibility (Sirenko *et al.*, 2022).

Therefore, the systematic approach of organic agriculture helps to mitigate the impact on climate change, promotes adaptation of farmers to climate change, creates sustainable farming systems, and also protects and improves biodiversity, has a positive effect on the protection of natural resources, reducing emissions of harmful substances into the air and water space, preserving the health of employees of enterprises and consumers of products.

#### **Materials and Methods**

The information base of the research is data from the Ministry of Agrarian Policy and Food of Ukraine, the Office for the Development of Entrepreneurship and Export, the platforms Organic Info and Organic Standard.

In order to understand the problems and prospects for the development of the Ukrainian organic market in the market environment, a forecast of the number of exported products for the period until 2025 was made using statistical analysis methods (average absolute growth, average growth rate, average growth rate). The forecast for L steps (time periods) in advance using the average absolute growth is carried out according to the formula:

$$\widetilde{y}_{n+L} = y_n + L\Delta\bar{y} \quad (1)$$

where  $y_n$  – is the actual value of the indicator at the last n-th point of the series;

$L$  – bias period;

$\widetilde{y}_{n+L}$  – forecast value of the (n+L)-th row;

$\Delta\bar{y}$  – is the value of the average absolute growth.

The forecast for L steps ahead using the average growth rate is carried out using the formula:

$$\widetilde{y}_{n+L} = y_n \times \bar{T}^L \quad (2)$$

The forecast for L steps ahead using the average growth rate is carried out using the formula:

$$\widetilde{y}_{n+L} = y_n \times (\overline{T_{np}} + 1)^L \quad (3)$$

### Results and Discussion

In Ukraine, in accordance with the order of the Cabinet of Ministers of Ukraine dated March 28, 2018 No. 199 ‘On the establishment of the state institution ‘Office for the promotion of exports of Ukraine’, the Office for promotion of exports in Ukraine was created and transferred to the sphere of management of the Economic and Financial Department of the Secretariat of the Cabinet of Ministers on the basis of the order of the Cabinet of Ministers of Ukraine dated September 2, 2020 No. 1071 ‘Some issues of the integral property complex of the state institution ‘Office for the promotion of exports of Ukraine’.

In accordance with the protocol decision of the Cabinet of Ministers of Ukraine dated March 10, 2021, the state institution ‘Office for the Promotion of Exports of Ukraine’ was renamed the ‘Office for the Development of Entrepreneurship and Exports’.

The purpose of the Office for the Development of Entrepreneurship and Export is to promote the development of the potential of Ukrainian exporters of organic products, to promote organic exports, as well

as to create a positive image of Ukraine as a reliable supplier of organic products abroad.

In 2021, Ukraine adopted the National Economic Strategy until 2030, the purpose of which, in addition to the goal of increasing organic agricultural land, is to increase the export of organic products to 1 billion dollars USA for the period until 2030.

In general, despite the full-scale war, Ukraine managed to preserve the organic sector, diversify its products and attract new participants to the organic market.

The impact of the war on the work of producers of organic products at the beginning of 2022 was manifested through:

- instability of demand and falling prices for organic products;
- significant costs for processing products and increasing electricity tariffs;
- untimely delivery of production elements;
- difficulties in ensuring production with packaging materials;
- problems with crossing the border, long queues at the border, protests;
- the impossibility of continuing certain production processes due to the mobilization of workers.

Exports of domestic organic products in 2022 remained almost at the same level as in 2021, falling by less than 6% ‘Figure 1’.

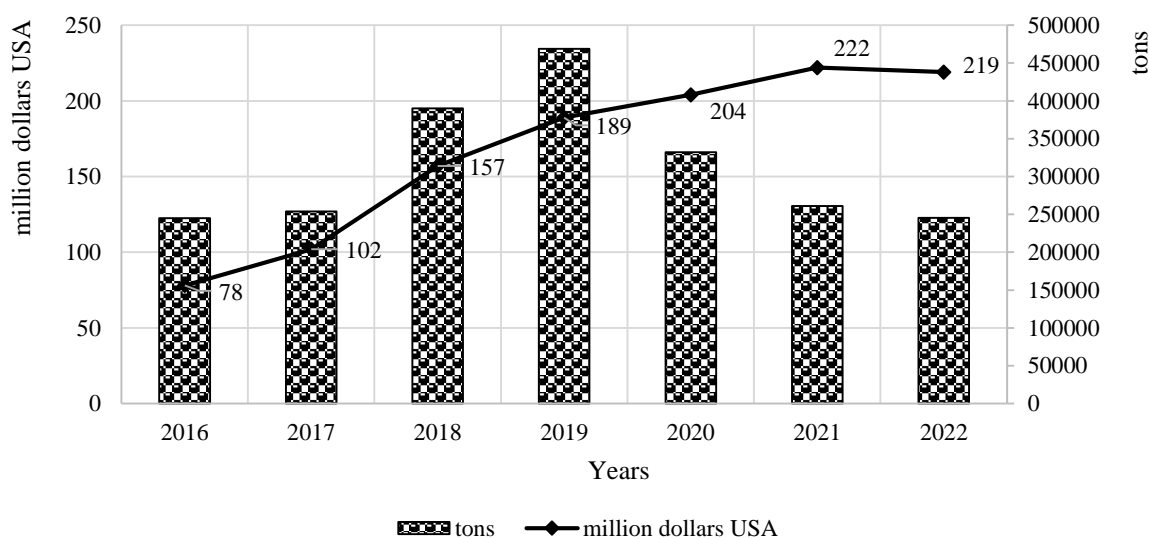


Figure 1. Implementation of Ukrainian organic agricultural products on the foreign market in 2016-2022.

In 2021, the total export of Ukrainian organic agricultural products amounted to 261,000 tons worth 222.0 million dollars USA. In the product structure of exports, the largest specific weight was occupied by corn (80.0 thousand tons for 22.0 million US dollars), soybeans (65.0 thousand tons for 59.0 million US dollars) and wheat (29.0 thousand tons for 14.3 million US dollars). Most organic products were exported to Europe – 82%, North America – less than 17%, Asia – more than 1%. In 2022, despite the full-scale invasion of the Russian

Federation on the territory of Ukraine, the total export of Ukrainian organic agricultural products amounted to 245,600 tons worth 219.0 million dollars USA.

In the commodity structure of exports, the largest specific weight was occupied by corn, soy and wheat. Sunflower oil, sunflower cake, sunflower, barley, rapeseed, millet, etc. were also exported. Most organic products were exported to Europe – 95% (including the EU – 85%, other European countries – 10%), North America – 4%, Asia – 1% ‘Figure 2’.

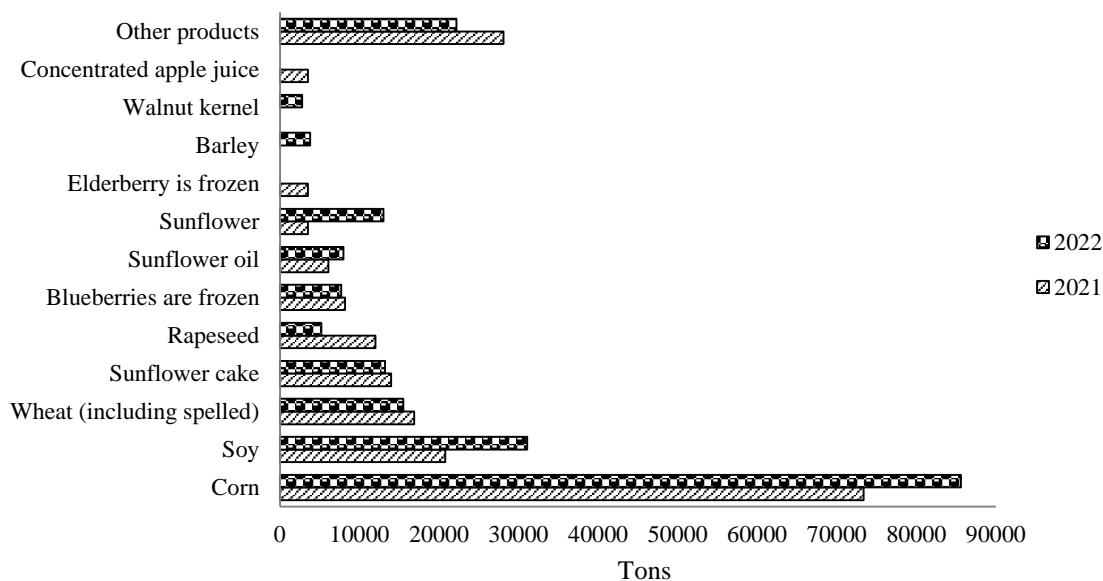


Figure 2. The most exported organic products from Ukraine to the EU in 2021–2022, tons.

According to the European Commission, in 2022, 219,000 tons of organic agro-food products were imported to the EU from Ukraine, thus Ukraine took a leading position among the exporting countries to the EU.

In 2021, the total volume of organic products exported from Ukraine to the EU in value terms amounted to 160.0 million dollars USA, and in 2022 – 184.0 million dollars USA ‘Figure 3’.

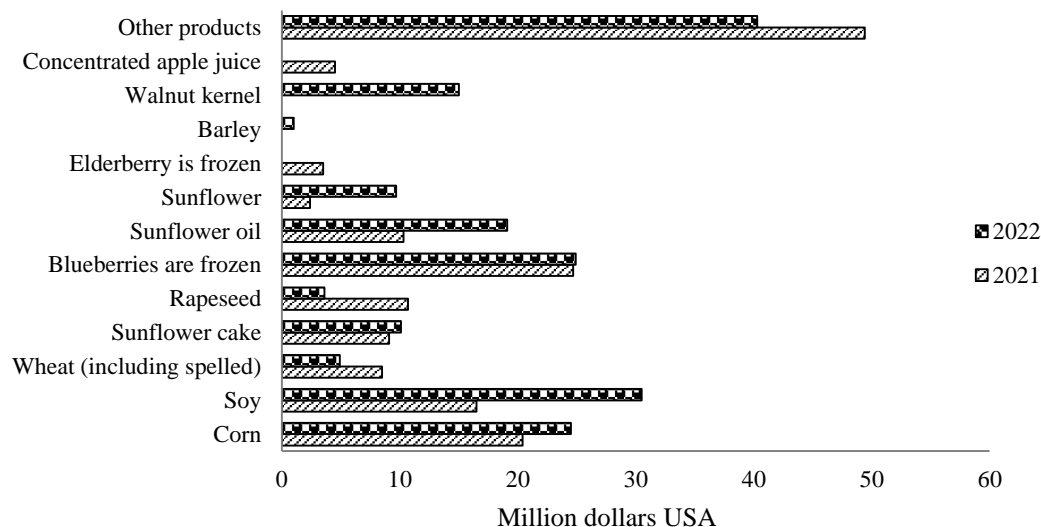


Figure 3. The most exported organic products from Ukraine to the EU in 2021–2022, million dollars USA.

Organic products were exported from Ukraine to European countries, mainly by rail and road transport. The volume of exports by ships has decreased, and it has become impossible to export by air.

In 2022, the largest importers of domestic organic products were the Netherlands, Germany, Austria, Poland, Lithuania, Italy, the Czech Republic, and others (Table 1). Thus, in 2022, 101.0 thousand tons of Ukrainian organic products worth 46.1 million dollars USA were exported to the Netherlands, Germany imported 33.1 thousand tons of organic products worth

35.6 million dollars USA, Austria received 27.3 thousand tons worth 35.8 million dollars USA, Poland – 13.4 thousand tons worth 22.3 million dollars USA, Lithuania – 10.6 thousand tons worth 5.2 million dollars USA, Italy – 6.3 thousand tons worth 9.9 million dollars USA, Czech Republic – 5.0 thousand tons worth 10.2 million dollars USA, Bulgaria – 5.0 thousand tons worth 4.1 million dollars USA, Romania – 2.2 thousand tons worth 1.7 million dollars USA, to France – 2.1 thousand tons worth 6.7 million dollars USA.

Table 1

**Top 10 importers of Ukrainian organic products in the EU in 2022**

Country	Volume, tons	Cost, million US dollars
Netherlands	101000	46.1
Germany	33100	35.6
Austria	27300	35.8
Poland	13400	22.3
Lithuania	10600	5.2
Italy	6300	9.9
Czech Republic	5000	10.2
Bulgaria	5000	4.1
Romania	2200	1.7
France	2100	6.7

In January 2023, 30,358.26 tons of organic agricultural products were exported, of which 16,478.35 tons were grain crops, 8,814.56 tons were oil and protein crops, 1,657.30 tons were fruits and nuts, 1,229.80 tons were oil cake, 907.19 tons were beverages, and 825.41 tons were processed products grain, 243.71 – vegetable oils, 103.10 – other products, 81.50 – honey, 17.33 – vegetables.

In January 2023, 23914.88 tons (78.78%) of organic products were exported by road transport, 6245.38 tons (20.57%) by rail, and 198.0 tons (0.65%) by water transport. 13,600.52 tons of organic grain crops, 5,447.01 tons of oil and protein crops, and 1,229.80 tons of oil cake were exported by road transport. 198.0 tons of vegetable oils were exported by water transport, and 2877.83 tons of grain crops and 3367.55 tons of oil and protein crops were exported by rail.

Most organic products are sent by road to the Netherlands (12,277.19 tons), Germany (3,868.92 tons), Italy (2,144 tons), etc.

Ukrainian organic products were exported to France by water transport (198.0 tons). 4101.65 tons were exported by rail to Austria, 1406.74 tons to Switzerland, and 736.99 tons to Germany.

In recent years, Ukraine has become an important exporter of organic products to the EU and the world market, including products with high added value. The Top 6 exporters of organic products with added value include: the company ‘Ukroliya’ (Poltava region) – a producer of organic high-oleic and linoleic sunflower oil, as well as organic cake; LLC ‘Agrofirma Pole’ (Cherkasy) – producer of organic millet to EU countries; LLC ‘Krasnohirsky Oil Plant’ is a manufacturer of a wide range of products, including unrefined sunflower and rapeseed oil, sunflower and rapeseed cake, sunflower husks; LLC ‘Skырskiy kombinat hliboproduktiv’ (Cherka region) – producer of various cereals, flour, as well as flour for baby food; LLC ‘Nature Green Ukraine’ (Transcarpathian region) – cultivation of shiitake mushrooms, royal mushrooms, gray mushrooms, yellow, pink, and Japanese enoki mushrooms; LLC ‘Lilak’ (Chernivetska region) – production of organic birch juice.

In 2023, there were five organic brands on the shelves of global retail chains: ‘Family Garden’, ‘Organic Milk’, ‘Brancho’, ‘Spring Drops’, ‘Rud/Eskimos Organic’.

In 2022, ‘Family Garden’ suffered destruction and theft of its fixed assets during the month-long occupation of the village by Russian invaders, but the enterprise recovered quickly enough and had a successful export season. Due to the war, Organic Milk faced the closure of export markets in the Persian Gulf countries and an increase in production costs, but the company expanded its export potential to EU countries.

The company ‘Rud/Eskimos Organic’ suffered destruction of warehouses and commercial equipment during the war, and also experienced a power outage from the fall of 2022.

In the conditions of a full-scale war, Ukraine maintains a leading position in the export of organic products thanks not only to the work of producers of organic products, but also to the constant search for ways to stabilize and overcome logistical difficulties. Such a situation in the future will make it possible to fulfil the tasks of the National Economic Strategy until 2030 regarding increasing the volume of export of organic products.

With this in mind, a forecast of the value of organic agricultural products exported by Ukraine for 2023-2025 was made (Table 2). Therefore, the results of the forecasting give reasons to claim that in the period up to 2025, the value of agricultural products exported by Ukraine will increase. Thus, the forecast value of the average absolute increase until the end of 2025 is 289.2 million dollars USA, which is more than the 2022 indicator of the study by 70.2 million dollars USA. In order to promote exports to foreign markets, the Office for the Development of Entrepreneurship and Exports provides entrepreneurs and exporters with assistance in supporting small and medium-sized enterprises; establishment of partnership and cooperation between domestic and foreign businesses; promotion of domestic goods and services in the external market environment; development of export competencies of domestic business.

Table 2

**Calculation of forecast values of the value of agricultural products exported by Ukraine  
(million US dollars)**

Years	Estimated values for:		
	average absolute growth	average growth rate	average growth rate
2023	$\hat{y}_{2023} = 219.0 + 1 \times 23.4 = 242.4$	$\hat{y}_{2023} = 219.0 \times 1.165^1 = 255.2$	$\hat{y}_{2023} = 219.0 \times (0.165 + 1)^1 = 255.2$
2024	$\hat{y}_{2024} = 219.0 + 2 \times 23.4 = 265.8$	$\hat{y}_{2024} = 219.0 \times 1.165^2 = 297.3$	$\hat{y}_{2024} = 219.0 \times (0.165 + 1)^2 = 297.3$
2025	$\hat{y}_{2025} = 219.0 + 3 \times 23.4 = 289.2$	$\hat{y}_{2025} = 219.0 \times 1.165^3 = 346.4$	$\hat{y}_{2025} = 219.0 \times (0.165 + 1)^3 = 346.4$

In addition, the Business and Export Development Office actively supports and organizes various events for organic exporters, including Biofach (Nuremberg, Germany), Anuga (Cologne, Germany) and Middle East Organic & Natural Products Expo (Dubai, UAE). Thus, the companies-exhibitors of the National Pavilion of Ukraine at Biofach 2024 became: LLC 'Avis' (Vinnytsia Region), LLC 'Agrofirma 'Pole' (Cherkasy Region), PE 'Galex-Agro' (Zhytomyr Region), LLC 'Dnipropetrovsk Food Company' VYZ (Dnipropetrovsk region), Danube Agrarian LLC (Odesa region), Catanzaro Eurasia LLC (Odesa region), D.S. Kolchanov LLC (Meetty) (Poltava region), Lickberry LLC (Kyiv region), LLC 'Natsy' (Slow Walnuts) (Transcarpathia region), LLC 'Organic Export' (Honey of Ukraine) (Kyiv region), LLC 'Organic original' (Ekorod) (Kyiv region), LLC 'Ukr-volnat' (Khmelnysk region), LLC 'Halsey Tradition' (Kyiv region), LLC 'Khimex LTD' (ProOrganica) (Kyiv region).

In order to develop organic production and circulation of organic products in Ukraine in the future, the Ministry of Agrarian Policy and Food of Ukraine closely cooperates with Switzerland within the framework of the program 'Development of trade with higher added value in the organic and dairy sectors of the economy' (QFTR) and 'Organic trade for development in Eastern Europe' (OT4D); Germany – within the framework of the project 'German-Ukrainian cooperation in the field of organic agriculture' (COA); EU – within the framework of the project 'Institutional and political reform of small-scale agriculture in Ukraine' (IPRSA).

Organic Standard has been operating in Ukraine since 2007 – the first Ukrainian certification body for organic production, which also provides export support services and explains the requirements of international standards. In 2023, 'Organic Standard': an educational video course was created on the requirements of EU organic legislation – Regulation 848/2018; the first certification body entered into the official State register of certification bodies in the field of production and circulation of organic products in the Ministry of Agrarian Policy and Food of Ukraine; the first certification body accredited by NAAU for certification under Ukrainian organic legislation; certification according to the new ISCC standard – the global certification system for sustainable development has begun.

**Conclusions**

In the conditions of a full-scale war, Ukraine maintains a leading position in the export of organic products thanks to the work of producers of organic products and the constant search for ways to stabilize and overcome logistical difficulties.

Compliance with the requirements for storage, transportation, processing of organic products and assessment of risks related to organic products, insurance from the leaders of the freight insurance market, involvement of certification bodies in the certification of products will allow exporters to minimize the likelihood of risks in the process of exporting organic products (Didovych *et al.*, 2023).

The research carried out by the authors allows us to draw the following conclusions:

1. The general state of export of organic agricultural products by domestic organic producers in the studied period generally has an upward trend; however, in 2022, exports decreased by almost 6%.
2. The main challenges faced by exporters of organic products in the conditions of military aggression are: disruption of supply chains, and therefore problems with the sale of organic products (blocked ports, insufficient amount of transport, fuel, drivers, destroyed infrastructure, lack of flights).
3. Military actions affected the export of organic products due to: instability of demand and falling prices for organic products; significant costs for product processing and an increase in electricity tariffs due to systematic power outages; untimely delivery of production elements; problems with crossing the border, long queues at the border, protests.
4. According to the results of the forecasting of the value of the export of agricultural products of Ukraine for the period until 2025, it was established that the value of the export of agricultural products in the average absolute period until the end of 2025 will amount to 289.2 million dollars USA, which is more than in 2022 by 70.2 million dollars USA, and it is a positive trend on the way to the realization of the target increase in the value of exports of organic products of Ukraine by 2030.
5. Ukraine has the potential to develop organic production and grow its export, which is confirmed by the statistical information analyzed in the research process, as well as the list of programs supporting Ukraine by international partners, and

- the constant popularization of organic products at international exhibitions.
6. Organic Standard – the certification body for organic producers is a catalyst for positive changes in the organic segment, as exporters of organic products have the support of the internal certification body (including according to the new ISCC standard) regarding issues of export and entering the external market environment.
  7. The development and strengthening of the export potential of organic products of Ukraine in the future will contribute to the increase of biodiversity and the reduction of greenhouse gas emissions in comparison with traditional agriculture and to ensure the gradual recovery of the ecosystem from the consequences of military actions.

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