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OKHRIMENKO OKSANA[1*], ZHUKOVSKA OLGA[2]

1* Doctor in Economics, Professor, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", e-mail: o.okhrimenko@kpi.ua, ORCID ID: 0000-0001-7361-3340

2 Ph. D. in Physics and Mathematics, associate professor National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" e-mail: zhukovskaya71@gmail.com, ORCID ID: 0000-0003-1110-9696

FORECASTING THE EXPORT POTENTIAL OF FODDER CORN PRODUCERS

Global food security is based on the uninterrupted supply of basic foodstuffs. In their structure, a significant place is given to fodder corn, used for fattening livestock and poultry and therefore exerts a significant influence on the production of meat, milk and eggs. Ukraine occupies an essential position in the world production and export of corn along with the USA, Brazil and Argentina. Components of export potential are unique for each country. At the same time, the growing global demand for fodder corn poses a task for producers to increase productivity, and therefore the production volumes of this crop. **Goal.** The purpose of the article is to analyze and build predictive models of export volumes to determine the distribution of the world feed corn market of the leading countries, taking into account the current situation related to military aggression in Ukraine. **Method.** In the process of the research, regression analysis was used to identify the dependence between the level of export volume and indicators of productivity and production prices for the studied countries; the Holt method - was for building predictive models, the results of which are used to forecast the volume of exports based on the constructed multiple regression equation; statistical analysis. **The results.** In the process of achieving leadership positions in the world fodder corn market, the producers of the studied countries underwent significant quantitative and qualitative changes in the process of crop production. Ukraine has significant potential for increasing the production and export of fodder corn. Considering the military actions in Ukraine, which complicated logistics processes, the study considers three scenarios: ideal - Ukrainian corn producers have the proper conditions for the production and transportation of corn; negative - Ukraine cannot export goods due to a lack of proper conditions for its production; limited - the reduction of cultivated areas, improper observance of agricultural technologies and limitations of logistical capabilities limit the production and export potential of the country. Scientific novelty. The factors affecting the export potential of the leading countries in the production of fodder corn have been identified. A forecast of productivity and production volumes has been developed. A scenario analysis was carried out. **Practical significance.** The value of the research lies in the development of theoretical and methodological provisions for assessing the country's export potential.

Keywords: export potential; fodder corn; prognostication; production efficiency; competitiveness; crop capacity; production price.

Formulation of the problem

The growth of the world's population stimulates the demand for food. In this context, close attention is focused on such a commodity position in the world food market as feed corn. Over the last decade, its world production has increased by almost 34% and continues to grow. In the structure of corn use more than 60% - for feed for poultry and livestock. As a guarantor of global food security, Ukraine is one of the four leading exporters of feed corn, which accounts for more than 80% of the world market. The food security of about 400 million people worldwide depends on Ukraine's grain exports. This study focuses on assessing the export potential of the world's leading producers of feed corn, which includes Ukraine. At the same time, the beginning of Russia's military aggression against Ukraine made production and logistics processes impossible due to security issues, and the ban on the export of many food items due to the priority of providing food to the citizens of Ukraine. Based on UNCTAD calculations, on average, more than 5 % of the import basket of the poorest countries are products that are likely to face a price hike resulting from the ongoing war in Ukraine [1]. An express survey of about 2,100 respondents about the expectations of the risk of famine associated with the Russian-Ukrainian war yielded the following results: unequivocally - 13%; rather yes - 29%; rather no - 36; definitely not - 15%; not determined with the answer - 7% [2]. Thus, expectations of food security issues are quite high - 41%. Further prospects for the development of international markets for

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agricultural products are associated with a high degree of uncertainty against the background of Russia's military aggression in Ukraine.

Analysis of recent research and publications

The issue of export potential and competitive position of individual countries and companies in the world market is not new. Scientific thought has accumulated a lot of methodological approaches and scientific research in this subject area. The essence of the export potential and international competitiveness of agrarian enterprises, devoted to the work of O. Yatsenko, N. Nevzgliad, A. Nevzgliad. Study of the competitive positions of Ukraine through the prism of compliance with the requirements of the pan-European labor market Kryukov. I., Kalina T., Panteleev V., Minakova S. Sardak S., Radzievska S.

The publications of Mattos F., Francoc da Silveira R., Pasichnyk Y. are devoted to the analysis and evaluation of conditions for the production of certain crops (forage corn) and food products with added value, which is also an important factor for the development of export potential. Falkendal T., Otto C., Schewe1 J., Jägermeyr J., Konar M., Kummu M., Watkins B., Puma M. focused on the study of the Covid-19 pandemic on grain exports.

Summarizing the existing developments and defining the objectives of this study, we focus on the importance of fodder corn production to ensure food security in terms of leading countries in production and exports. Each country has its own unique conditions for production and export potential that can be built and developed.

At the same time, it is important to understand how the combination of factors in the production of feed corn can affect the export potential of an individual country and possible export scenarios given Russia's military aggression in Ukraine.

Formulation of article objectives

The purpose of the study is to assess the export potential of Argentina, Brazil, the USA and Ukraine in the fodder corn market by building predictive models taking into account the scenario of a stable situation and in conditions of military aggression. To achieve the goal, the following tasks are solved: to assess the export potential of corn production in the USA, Brazil, Argentina and Ukraine based on data from the Food and Agriculture Organization of the United Nations (FAO); to develop a forecast of fodder corn export volumes and its structure in terms of leading countries under conditions of military aggression and under conditions of stability; to analyse the factors affecting the export potential of each of the studied countries.

Methodology

The assessment of the export potential of countries is carried out taking into account factors of production and demand. The factor of production is expressed through indicators of sown area and yield, which in turn indicates the efficiency of production through the use of the latest agricultural technologies and taking into account the weather factor. Demand is analysed by the volume of exports in physical and monetary terms. To estimate the factors of influence, the construction of multiple regression equations and the Holt method are used:

$$\hat{y}_{0k} = \alpha y_k + (1-\alpha)(\hat{y}_{0k-1} - t_{k-1}), \quad (1)$$

$$t_k = \beta(\hat{y}_{0k} - \hat{y}_{0k-1}) + (1-\beta)t_{k-1}, \quad (2)$$

$$\hat{y}_{k+p} = \hat{y}_{0k} + pt_k, \quad (3)$$

where $\hat{y}_{0k}$ – smoothed value for the period,

α – series smoothing coefficient,

y_k – current value of the series,

$\hat{y}_{0k-1}$ – smoothed value for the previous period,

t_{k-1} – value of the trend for the previous period,

β – trend smoothing coefficient,

$\hat{y}_{k+p}$ – forecast for p periods,

p – serial number of the period for which we make a forecast,

t_k – recent trend.

In addition, comparative analysis of the main parameters of feed corn production is carried out on the example of Argentina, Brazil, USA and Ukraine.

Presenting main material

According to the statistical data of the Food and Agricultural Organization of the United Nations (FAO) for 19 years, a multiple regression level was constructed for Argentina, Brazil, the USA and Ukraine (Table I), on the basis of which the dependence of exports on the productivity of prices and production was studied. The

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constructed equations of multiple regression are statistically significant, because the inequality $F > F_{\alpha;p;n-p-1}$ is fair for each equation (Table II). Yield is an indicator of production efficiency, as it mediates natural and climatic conditions, technologies for growing, transporting and storing crops. This indicator corresponds to M. Porter's theory of international competitiveness, which connects it with the efficiency of available resources. The price of corn production represents all cost items that form the cost and serve as an element of competitiveness, as grain traders are guided in concluding agreements, including the price of such an agreement. Of course, the competitive position of feed maize producers in a country is influenced by many more factors, such as domestic consumption, trade quotas, existing logistics systems, soybean substitutes.

Table 1

Multiple regression equation of maize export dependence

Country	Equation	R-sq(adj)
USA	E = 576908 – 40,23 H + 0,0011121 P	88,16%
Brazil	E = 245926 – 17,91 H + 0,002434 P	93,29%
Argentina	E = 307613 – 2,57 H + 0,00934 P	89,18%
Ukraine	E = 267507 – 37,64 H + 0,00584 P	91,02%

where E– export, USD; H– yield, USD / ha, P– production price, USD /m.

Table 2

Value of F-criterion

Country	F	$F_{0,01;2;15}$
USA	55,86	6,36
Brazil	104,24	
Argentina	61,79	
Ukraine	76,04	

Ukraine has been gradually increasing the production of fodder corn since 2000, but a dramatic increase has been taking place since 2010. In a relatively short period of time, Ukraine has managed to approach and even surpass the leaders of this market (Table 3), using intensive technological tools. technology).

This crop has a high potential for cultivation in Ukraine due to favourable climatic conditions, expansion of sown areas by 2.4 times, increasing yields almost twice (for the period from 2004 to 2021). Ukraine's main competitor is also actively using the technological way to increase yields, and currently corn yields in the United States reach more than 100 c/ha.

To forecast the volume of exports and its structure in terms of leading countries, it is necessary to determine the key parameters of (H) and production prices (P). To do this, we build a forecast model using the Holt method, because the study of the structure of the time series showed the presence of a trend and the absence of periodic fluctuations. Figures 1-4 show the result of the Holt model. In the graphs, the orange line shows the real values of corn yield, and the black - the forecast.

Agriculture in Argentina is associated with a high probability of droughts. The El Niño-Southern Oscillation phenomenon (ENSO) could reduce corn yields by more than 30%, which in turn could lead to a 10% reduction in its exports. Graph on the Fig. 1 shows yield failures associated with unstable weather conditions.

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Table 3

Comparative characteristics of the main factors of corn production by world market leaders

Indicators	Unit measure-ment	Period									
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Argentina											
Sowing area	mln ha	3,7	4,9	4837	4,6	5,3	6,5	7,1	7,2	7,7	7,2
Yield capacity	c/ha	57,4	66	68,4	73,1	74,4	75,8	60,9	78,6	75,5	72,2
Brazil											
Sowing area	mln ha	14,2	15,3	15,4	15,4	15,0	17,4	16,1	17,5	18,3	21,6
Yield capacity	c/ha	50,1	52,5	51,8	55,4	42,9	56,2	51,1	57,8	57	53,2
USA											
Sowing area	mln ha	35,4	35,4	33,6	32,7	35,1	33,5	32,9	32,9	33,4	34,6
Yield capacity	c/ha	77,3	99,3	107,3	105,7	117,4	110,8	1107,5	105,1	108	110,9
Ukraine											
Sowing area	mln ha	4,4	4,8	4,6	4,1	4,3	4,5	4,6	5,0	5,4	5,5
Yield capacity	c/ha	47,9	64,1	60,2	57,1	66	55,1	78,4	71,9	56,2	80,0

(Source: Created by the authors based on FAO data)

Maize producers are trying to correct this risk by introducing the concept of zonal management (yield strongly depends on the production area), the use of climate forecasts and seasonal changes in basic production parameters, the use of crop rotations and more. According to the results of the study, Argentina has the potential to increase corn production by 9.5 million tons without increasing sown areas, which can have a significant impact on world exports, but with significant fluctuations due to changing climate conditions [3].

Significant corn acreage in Brazil is associated with different climatic conditions and yields in the central and southern regions of the country. These differences are manifested in both growing seasons (sowing for the first season begins in September, for the second - in January. As a rule, higher yields are observed in the first season. In the second season, along with the lack of growing season there is a lack of moisture. The expansion of winter corn crop in the Brazilian center-west is associated with productivity growth and the increase in planted area. Winter crop productivity has increased from 15 and 29 bushels/acre in the 1980s and 1990s, respectively, to 80 bushels/acre between 2010/11 and 2016/17, exceeding the level of summer crop productivity [4].

There are twofold differences in agricultural technologies, which means that the average yield in Brazil was 57 c/ha in 2020 and 108 c/ha in the United States in 2020 (Tab.3). Thus, Brazil can be considered to have significant potential for increasing production volumes. corn, provided that the existing and the introduction of the latest agricultural technologies such as the improvement of varieties and the introduction of innovative equipment and taking into account the variability of natural conditions. The forecast according to the Holt method shows the suspension of the fall and the stabilization of the yield level (Fig.2).

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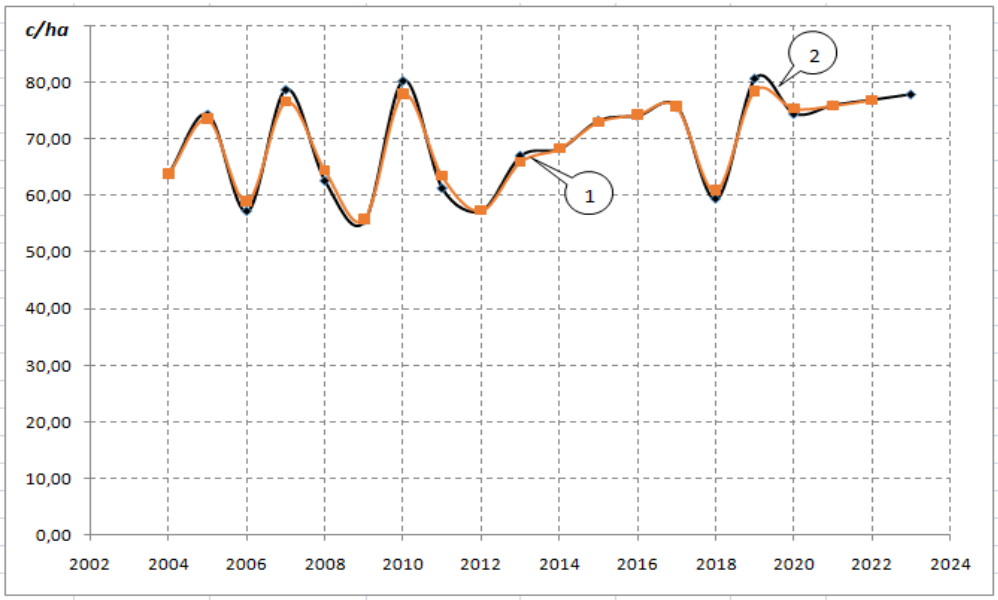

Fig.1. Yield dynamics (c/ha) of corn in Argentina α=0,63, β=0,54 (Holt model coefficient), 1– original values, 2– forecast values

Source: Calculated by the authors based on FAO data

Targeted government support in the form of agricultural loans and investments in infrastructure also contributes to the development of corn production and increase its efficiency.

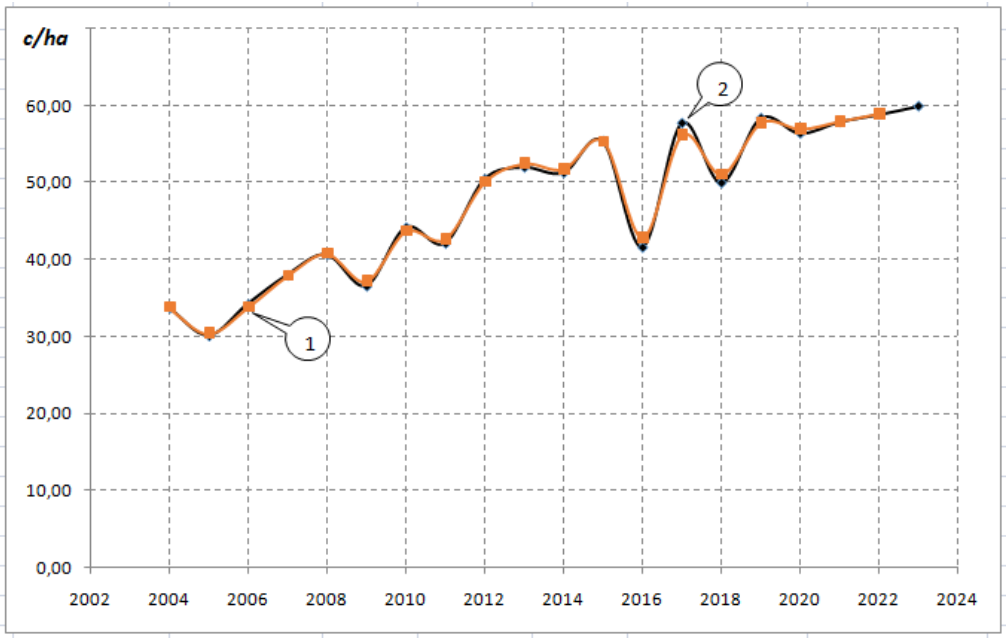

Fig.2. Yield dynamics (c/ha) of corn in Brazil α=0,65, β=0,54 (Holt model coefficients), 1– original values, 2– forecast values

Source: Calculated by the authors based on FAO data

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Thanks to The Federal Agriculture Improvement and Reform Act of 1996 in USA, which allowed farmers to determine the structure of crops, the area of corn increased by almost 50%. About 40% of the area allocated for this crop serves the production of ethanol. At the same time, the number of farms in the United States that produce feed corn has decreased. The team of researchers found that 48% of the yield gain was associated with a decadal climate trend, 39% with agronomic improvements, and, by difference, only 13% with improvement in genetic yield potential. Crop density and optimal application of mineral fertilizers allow to provide a yield increase of 39%. Genetically modified seed material and agricultural technologies increase yields by 40-50 kg per hectare [5]. For the third year in a row, grain crops, including corn, have been negatively affected by the natural phenomenon of La Niña (a drop in surface water temperature below the climatic norm), which causes dry weather in the Midwest (in the prairies) [6] . In 2022, about 30% of the sown areas in the USA were affected by the drought (Fig. 3).

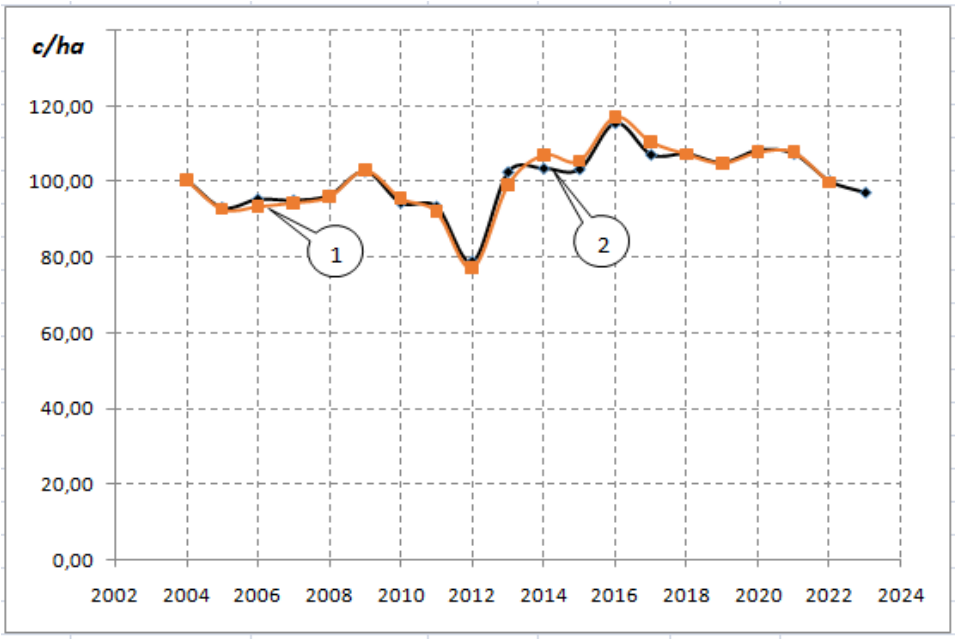

Fig.3 Yield dynamics (c/ha) of corn in USA α=0,66, β=0,65 (Holt model coefficient)
1- original value, 2- forecast values
Source: Calculated by the authors based on FAO data

Ukraine is currently lagging behind the US yield. However, there is an objective explanation for this situation. According to Karpenko O. Head of Black Sea Cluster at Louis Dreyfus Company: “Only 3-5% of Ukrainian corn is genetically engineered. Ukraine has taken its place on the world corn map — those are markets that give priority to non-GMO corn, and our producers have developed their brand there. This may change over time. GMO-corn, of course, has its advantages. For example, it is easier to estimate yields and plan for higher production, but everyone chooses for himself, and today non-GMO corn has more liquidity in the world” [7].

Other factors that affect the yield of corn in Ukraine are temperature and humidity. Improving the mechanisms of optimization of mineral nutrition and humidity control will increase the yield of GMO-free corn. On the other hand, it will reduce losses and stabilize the cost of corn.

Irrigation should be included in the agricultural technologies that affect Ukraine's export potential. As the average temperature in Ukraine increases by 1.7 annually, there is a problem of insufficient moisture in crops. "Irrigation and drainage strategy in Ukraine until 2030" was adopted in 2019 and provides for sustainable eco-balanced development of agriculture. During the period from 2014 to 2021, irrigated areas under cereals increased by 84%. In 2020, 59.9 thsn. ha of irrigated land grew corn.

During the last 15-18 years, a positive trend in the growth of corn yield was noted in Ukraine, which is connected with the improvement of seed material and improvement of agricultural

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technologies. There were several periods of drastic reduction in productivity in 2013, 2018, 2020, which is related to drought. A very strong drop in this indicator takes place in 2022, by almost 20 c/ha, which is associated with the violation of agricultural technology due to the state of war in Ukraine and military activity. But this negative trend is rather an exception to the general pattern and is related to an emergency situation. The future harvest also remains in the risk zone (Fig. 4).

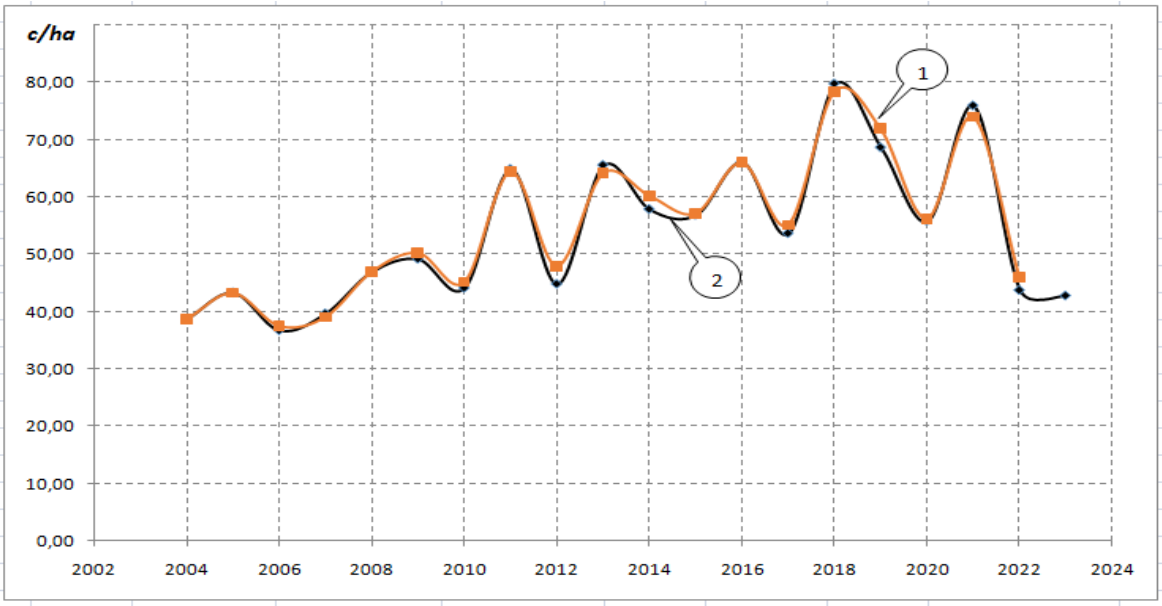

Fig.4. Yield dynamics (c/ha) of corn in Ukraine α=0,65, β=0,56 (Holt model coefficient) 1- original value, 2- forecast values

Source: Calculated by the authors based on FAO data

In fig. 5-8 shows the forecast of corn production in the leading countries based on the Holt method. For Ukraine, this scenario is possible only under previous economic conditions that took place before the Russian-Ukrainian war and demonstrate the existing production potential and, as a result, an increase in the export of fodder corn.

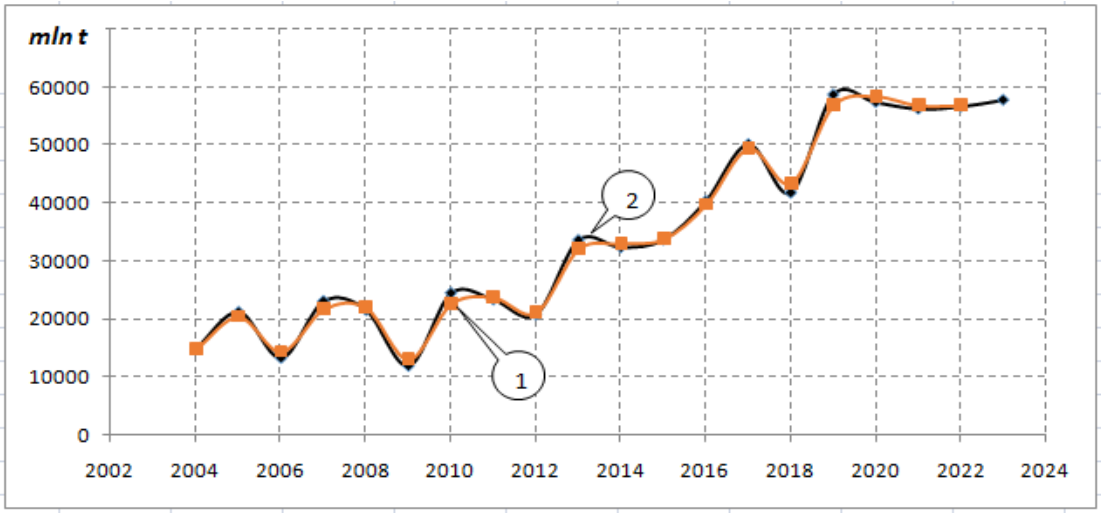

Fig.5. Production forecast in Argentina α=0,67, β=0,56 (Holt model coefficient) 1- original value, 2- forecast values

Source: Calculated by the authors based on FAO data

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Argentina is a major net exporter of feed corn, as it exports more than 70% of its output. Together with Brazil, it begins harvesting in February and forms pricing policies in international markets. Ukraine, which enters the market in August, has to focus on the price parity that has developed so far. The increase in corn production here is due to both a 2.66-fold increase in sown areas over a ten-year period and an increase in yields. Unfavorable state policy, which provides for high export duties, has stimulated the introduction of a number of innovations aimed at improving the efficiency of corn production: without arable farming, the use of pesticides and crop rotations. At the same time, the use of pesticides makes it impossible to export Argentine corn to EU countries. Under somewhat unfavourable weather conditions, it is possible to predict a decline in corn production in the 2022/23 marketing year at the level of 58.2 million tons, of which 39 million tons can be exported in the absence of restrictions. From April, we can expect the appearance of Argentine corn on the stock exchanges, which is associated with high transportation costs.

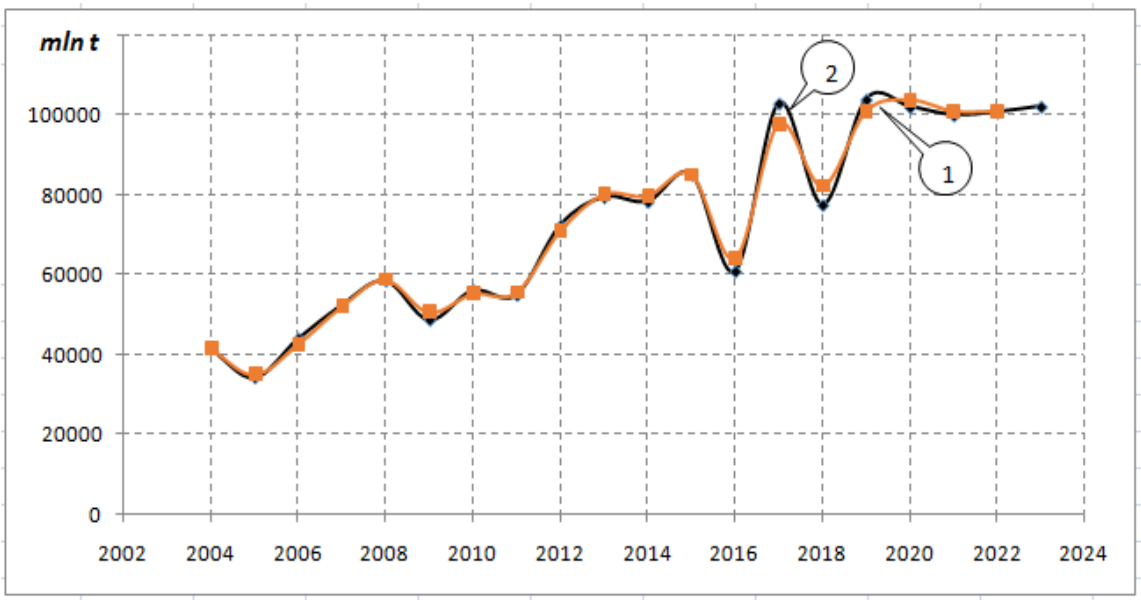

Fig. 6. Production forecast in Brazil α=0,65, β=0,54 (Holt model coefficients) 1– original values, 2– forecast values

Source: Calculated by the authors based on FAO data

The forecast of corn production in Brazil confirms its status as one of the largest exporters. A feature of corn production in this country is to get two harvests a year. The possibility of a double harvest helps reduce the risk of adverse weather conditions. Significant production volumes are achieved due to a significant increase in sown areas. Only for the period from 2011 to 2020, this increase was 38%. Another component of the growth of export potential is the growth of productivity, which increased by 35% over the same period. Therefore, during this period, corn exports increased more than 3 times.However, the risk of drought is difficult to overcome even with the latest technology. In view of this, the presented forecast shows the production of fodder corn of 102,5 million tons, of which 43 million tons will be offered for sale on foreign markets.

It is expected that the drought in the USA on 82% of the territory may lead to a reduction of the corn harvest in 2023 to 335 million tons. At the same time, 54-55 million tons may be offered for export. The lion's share of the harvest in the United States goes to domestic consumption and only 16-18% goes to exports.

Given that the largest buyers of fodder corn are already looking for alternative sources of corn imports, given the military events in Ukraine, the United States is considering almost the only alternative in the supply of this crop. Given these circumstances, experts expect an increase in corn prices on the Chicago Board of Trade at 280 USD /t [8].

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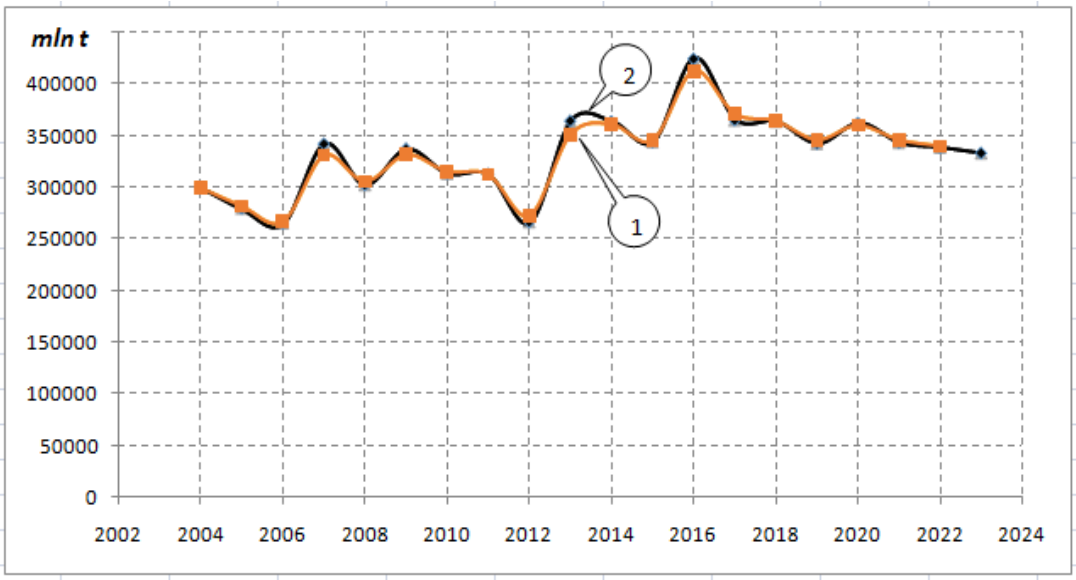

Fig. 7. Production forecast in USA α=0,65, β=0,54 (Holt model coefficients), 1– original values, 2– forecast values

Source: Calculated by the authors based on FAO data

Ukraine is a relatively new player in the world corn market. During the period from 2010 to 2020, Ukraine increased its sown area almost twice, yield - by 60%. As a result, it allowed the country to occupy an honourable fourth position among the world's leading corn exporters. In terms of the structure of grain crops, Ukraine is similar to the United States, as the lion's share in both cases is occupied by corn and wheat. At the same time, Ukraine lags far behind the United States in terms of yields, as noted above.

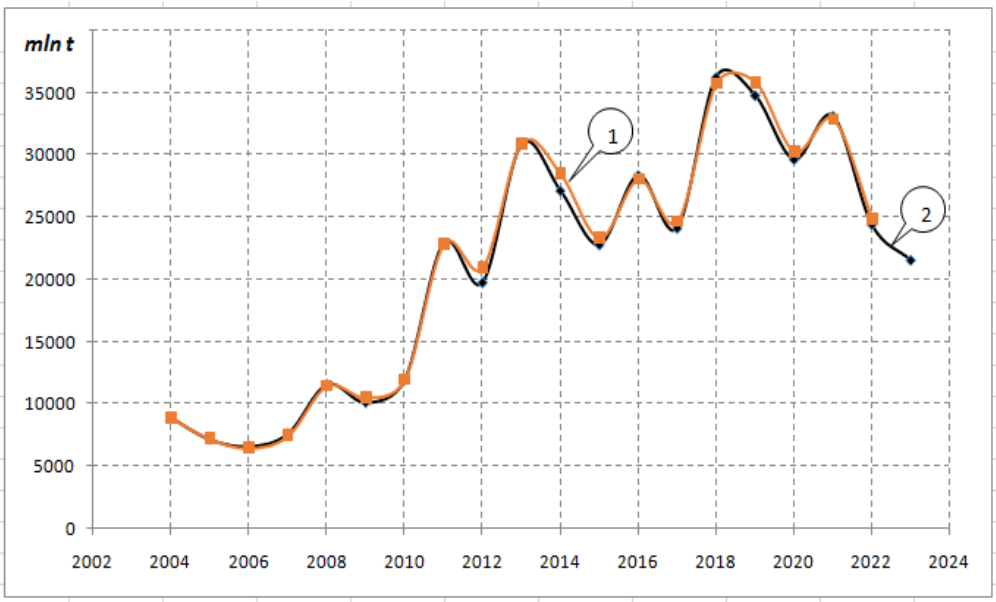

Fig 8. Production forecast in Ukraine, α=0,63, β=0,647 (Holt model coefficients) , 1– original values, 2– forecast values

Source: Calculated by the authors based on FAO data

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However, it was impossible to complete the 2021-2022 marketing year under the previous scenario. The previous forecast of deliveries of 33-34 million tons of corn to foreign markets of Ukraine did not come true due to the military invasion of the Russian Federation. According to actual data, Ukraine was able to export 23.5 million tons in the 2021-2022 marketing year, given the impossibility of transportation by sea. The volume of alternative road transportation was no more than 600,000 tons per month or 10-15% of the throughput through sea ports. In 2023, a further drop in production volumes is expected to 25 million tons. At the same time, exports may amount to 17-18 million tons, provided that the situation with production conditions and logistics does not deteriorate.

According to the results of the forecast assessment, taking into account the loss of acreage, damage to crops, violations of production technologies and a decrease in yield, the actual losses of corn production in Ukraine will amount to 3 billion. euro. [9].

If we talk about the export potential of the leading countries, we mean what share of the world market they can cover in the ideal scenario: favorable climatic conditions, projected costs, availability of innovative technologies, stable demand, no restrictions on exports and more. Under such conditions, the shares of leading countries in the world market are distributed as follows (Fig. 9).

In a negative scenario, Ukraine cannot export goods due to the lack of proper conditions for its production and/or its transportation.

At the same time, its market segment is redistributed among other exporters (Fig. 10). And under the limited scenario, under which Ukrainian producers have to work, the production of fodder corn, and therefore the volume of its exports, falls due to a decrease in sown areas (war zones, mined territories) and a decrease in yield (non-compliance with the requirements of agricultural technologies due to the lack of appropriate means or the inability to perform them properly). (Fig. 11).

Fig. 9. Distribution of the world market of fodder corn with the participation of Ukraine: ideal scenario

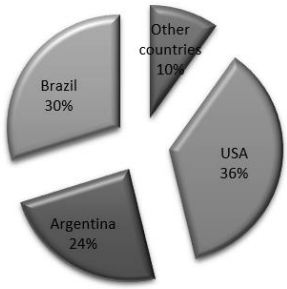

Fig. 10. Distribution of the world market of fodder corn without the participation of Ukraine: negative scenario

Fig.11. Distribution of the world market of fodder corn with the participation of Ukraine: limited scenario

Source: Calculated by the authors

Conclusions

The country's export potential is an important indicator that covers its production capacity and external demand for the results of this production. In the agricultural sector, production opportunities are based, including on climatic conditions, which must correspond to the specialization of production.

In forecasting the export potential of countries in the field of corn production, the main factors influencing the volume of exports were chosen yield, as a comprehensive indicator of climate conditions and cultivation technologies and production prices, which combines the cost of resources and efficiency.

An assessment of the export potential of the world's major feed corn exporters has shown that these countries are truly important players in this segment and have long undergone quantitative and qualitative changes in feed corn production processes to achieve leadership positions.

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Ukraine, which has relatively recently entered the world market as a major exporter, has significant potential to strengthen its position. Calculations show that Ukraine has the potential to increase the production of feed corn in an intensive way due to the growth of its yield. Under such conditions, its share in world exports could be expected to increase to 18% in the near future. At the same time, military aggression made logistical processes impossible and called into question the production processes.

Under the negative scenario, when Ukraine is pushed out of the world market, other participants will face increased demand for fodder crops, including corn. This leads to rising stock market prices, animal feed shortages and consequent livestock declines, rising food prices and food security risks.

The limited scenario currently plays the function of balancing supply and demand and preserving the non-import potential of Ukraine in this market segment. With the normalization of production and transportation conditions, Ukraine has adequate potential to return to its position in 2020-2021. to increase the share in the world market.

Thus, for the full realization of export potential, the country must have not only the right climatic conditions for well-established production processes, but also the ability to transport products.

As the team of authors begins in their research, it is necessary to further strengthen the importance of increasing production capabilities in order to withstand the risks of the Russian-Ukrainian war. At the same time, global international organizations should also strengthen the function of balancing the global demand for food between large and small countries. And it is the weakly protected countries of Africa and Asia that should be given more attention in the context of minimizing food security risks [10]. The next scientific study should be a study of the latest configuration of the food market in the context of ensuring global food security with the participation of Ukraine.

ОХРІМЕНКО ОКСАНА[1*], ЖУКОВСЬКА ОЛЬГА[2]

1* Доктор економічних наук, професор, Національний технічний університет України «Київський політехнічний інститут імені Ігоря Сікорського», e-mail: o.okhrimenko@kpi.ua, ORCID ID: 0000-0001-7361-3340

2 Кандидат фізико-математичних наук, доцент, Національний технічний університет України «Київський політехнічний інститут імені Ігоря Сікорського», e-mail: zhukovskaya71@gmail.com, ORCID ID: 0000-0003-1110-9696

ПРОГНОЗУВАННЯ ЕКСПОРТНОГО ПОТЕНЦІАЛУ ВИРОБНИКІВ ФУРАЖНОЇ КУКУРУДЗИ

Світова продовольча безпека базується на безперебійному забезпеченні основних продуктів харчування. У їх структурі вагоме місце відводиться фуражній кукурудзі, що використовується при відгодівлі худоби та птиці, а відтак здійснює вагомий вплив на виробництво м’яса, молока та яєць. Україна обіймає вагомі позиції у світовому виробництві та експорті кукурудзи поряд з США, Бразилією та Аргентиною. Складові експортного потенціалу є унікальними для кожної країни. Разом з тим зростаюча світова потреба у фуражній кукурудзі ставить перед виробниками завдання щодо зростання урожайності, а відтак обсягів виробництва даної культури. **Мета.** Мета статті- аналіз та побудова прогнозних моделей обсягів експорту для визначення розподілу світового ринку фуражної кукурудзи країн-лідерів із врахуванням поточної ситуації, пов’язаної з військовою агресією в Україні. **Методика.** У процесі дослідження використано регресіійний аналіз для виявлення залежності між між рівнем обсягу експорту та показниками урожайності й ціни виробництва для досліджуваних країн; метод Хольта- для побудови прогнозних моделей, результати яких використано для прогнозування обсягу експорту на основі побудованого рівняння множинної регресії; статистичний аналіз. **Результати.** У процесі досягнення лідерських позицій на світовому ринку фуражної кукурудзи, виробники досліджуваних країн зазнали значних кількісних та якісних змін у процесі виробництва культури. Україна має значний потенціал до нарощування обсягів виробництва та експорту фуражної кукурудзи. Зважаючи на військові дії в Україні, які ускладнили логістичні процеси, у дослідженні розглядаються три сценарії: ідеальний- українські виробники кукурудзи мають належні умови для виробництва та транспортування кукурудзи; негативний - Україна не може експортувати товар через відсутність належних умов для його виробництва; обмежений – скорочення посівних площ, неналежне дотримання агротехнологій та обмеження логістичних можливостей обмежують вирбничий та експортний

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потенціал країни. **Наукова новизна.** Виявлено фактори впливу на експортний потенціал країн-лідерів виробництва фуражної кукурудзи. Розроблено прогноз урожайності та обсягів виробництва. Проведено сценарний аналіз. **Практична значимість.** Цінність дослідження полягає у розвитку теоретико-методичних положень оцінювання експортного потенціалу країни.

Ключові слова: експортний потенціал; фуражна кукурудза; прогнозування; ефективність виробництва; конкурентоспроможність; урожайність; ціна виробництва

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