

**ЗЕРНОПРОДУКТОВЫЙ ПОДКОМПЛЕКС: ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ РАЗВИТИЯ****Яремчук Н.В.**

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**GRAIN SUBCOMPLEX: PROBLEMS AND DEVELOPMENT PROSPECTS****Yaremchuk N.**

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**Аннотация**

В статье акцентировано внимание на важности и необходимости стабильного развития зерновой отрасли в частности и зернопродуктового подкомплекса в целом, что будет способствовать позитивной динамике развития агропромышленного комплекса и экономики государства.

Внимание уделяется интенсивному возростанию экспортной ориентации зернопродуктового подкомплекса, что исключает надлежащее развитие зерноперерабатывающих отраслей. Неготовность производства продукта с добавленной стоимостью внутри страны лишает экономику значительных финансовых вливаний.

Проанализированы показатели урожайности по отдельным культурам и сделан вывод о наявности потенциальных возможностей расширения горизонтов производительности. Также концентрируется внимание на проблеме падения уровня рентабельности производства зерновых и нерационального распределения прибыли в сторону товаропроизводителя. Причиной сложившейся ситуации можно считать усиление влияния на ценовую ситуацию внутреннего рынка уровня экспортной активности зерно трейдеров.

Внесены рекомендации по усовершенствованию стратегии управления зернопродуктовым подкомплексом с ориентацией на обеспечение внутреннего спроса на зернопродукцию, что повлечёт за собой создание новых рабочих мест, развитие перерабатывающих отраслей.

**Abstract**

The article focuses on the importance and necessity of stable development of the grain industry and the grain of the product subcomplex as a whole, for the positive dynamics of agro-industrial complex and the state economy.

Attention is paid to the intensive growth of export orientation of grain product subcomplex, which excludes the proper development of grain processing industries. The unwillingness to produce value-added products within the country deprives the economy of significant financial injections.

Yield indicators for individual crops have been analyzed and a conclusion has been drawn about the implicit potential for expanding the horizons of productivity. Also the attention is concentrated on the problem of falling profitability level of grain production and irrational profit distribution towards the producer. The reason for this situation can be considered the strengthening of influence of the level of export activity of grain traders on the price situation of the domestic market.

Recommendations were made to improve the strategy of grain product subcomplex management with a focus on meeting domestic demand for grain products, which will lead to the creation of new jobs, development of processing industries.

**Ключевые слова:** зернопродуктовый подкомплекс, урожайность, рентабельность, агрохолдинг, стратегия развития.

**Keywords:** grain product subcomplex, yields, profitability, agricultural holding, development strategy.

**Formulation of the problem.** Modern socio-economic and socio-political realities determine the vector of development of national economy of Ukraine. Today, the agro-industrial complex plays a significant role in the formation of sustainable and effective economic development, food, and therefore the national security of the country.

The strategic task of the development of the domestic grain subcomplex of Ukraine should be the full satisfaction of its own needs in grain (taking into account its needs for the production of cattle-breeding

products) and the increase of export potential, preferably not in the fodder grain, but in the products of its processing, products of cattle-breeding or bioethanol, which will allow to leave in the state the added value, to increase the number of jobs, to approach the solution of social problems of rural communities. Almost at all historical stages of development of society grain was and still is an important source of wealth of Ukraine. It is an important export product, which provides significant foreign exchange earnings, and for agricultural enterprises is the basis of cash receipts and profits. With

proper storage grain practically does not lose its qualities, so it is suitable for creating state reserves for the production of food and fodder. In Ukraine, grain farming is the leading sector of agricultural development and an important source for improving the material welfare of the people.

**Presenting main material.** Each state, as an economic entity, possesses its own inherent features, which become fundamental in shaping the development of regional agricultural complexes. Grain products subcomplex is no exception, in which grain farming is the key and determining component. It accounts for more than 50% of the subcomplex production volume. This situation is typical for Ukraine. For comparison: in the USA the grain sector provides only 13% of the gross output of the subcomplex, while 73% of the cost of the produced grain products falls on the grain processing and marketing sectors. According to USDA estimates, world production of grain crops amounts to 1.98 billion tons, of which 63.8 million tons or 3.1% is Ukrainian grain [9].

Some of the world's grain production is rather small, but Ukraine is one of the few countries that exports many times more than it consumes. That is why the development of the grain industry is influenced by global trends in this sphere.

Grain production in Ukraine for a long historical period occupies one of the main places in the development of agriculture as a sector of priority in ensuring food security of the state, serves as a raw material base for the manufacture of many industrial goods, belong to important sources of feed resources for the development of animal husbandry, plays a determining role in the formation of exports of food products.

The natural and climatic conditions and fertility of Ukraine's land make it possible to obtain high-quality food grains in quantities sufficient to satisfy domestic needs and build export potential. It took about twenty years for grain farming to rise to a level "above" production in 1990. Today the Ukrainian agricultural market meets not only the needs of its own citizens, but also makes its contribution to the trade balance of 190 countries.

As of the end of 2019, Ukraine harvested a record 74.3 million tons of grain and leguminous crops from the area of 15 million ha. Ukrainian agrarians still harvest about 4 t/a of wheat and slightly more - 5 t/a of corn, while European farmers have reached an average of 8 t/a of wheat, and in the U.S. the average yield of corn is 11 t/a. In addition, Britain last year recorded record wheat yields of 16.82 tonnes per hectare, while the U.S. has corn hybrids that produce over 20 tonnes per hectare. However, unlike many European producers, we remain profitable. And even despite the shift of climate zones, analysis of the dynamics of grain production shows that the indicator of yields in Ukraine continues to grow. The reason for the growth of yields is hidden in the technologies of grain and oilseeds production, as well as in the future expansion of irrigation of fields.

According to the Organization for Economic Cooperation and Development (OECD) and the Food and Agriculture Organization of the United Nations (FAO),

global consumption of cereals and grains is likely to grow until 2026, a projected increase of 13% compared to the base period (2014-2016), to 2863 million tons. Global wheat consumption is expected to increase by 11 percent between now and 2026. Feed use of wheat is predicted to increase in China, Pakistan, Vietnam. The shares of the top 5 wheat importers (Egypt, Indonesia, Algeria, Brazil, Japan) are likely to remain consistently high. World maize consumption is also projected to intensify. Specifically, corn consumption is expected to increase primarily in African countries - by an average of 3% per year. Vietnam has a chance to replace Egypt as the 5th largest corn importer.

The growth of consumption and demand for grains in the world is primarily due to an increase in the world population. Thus, according to the UN, by 2050 the Earth will be populated by about 9 billion people. Actually, the population growth will be mainly due to Africa and Asia, where Ukraine traditionally has strong positions of grain export [5].

In market conditions of conducting economy there is an urgent question of economic relations of agricultural commodity producers, grain processing enterprises as the main subjects of grain market and consumers of grain products.

The unstable state of grain branch as the basis of grain product subcomplex is able to slow down the growth of the majority of branches of agroindustrial complex of the country, in particular, flour-grain, bakery, biofuel, branch of cattle-breeding, which will affect the state of transport branch, export opportunities, rates of development of economy as a whole.

Studies have confirmed the existence of a tendency in the grain subcomplex to create transregional highly integrated corporate formations, which are called "agricultural holdings". Using the mechanisms of mergers and absorption of agricultural enterprises of traditional type, gradually since 2005 on the basis of limited liability companies (LLC), private enterprises (PE) complex associated organizational structures have emerged, which consist of branches, controlled and subsidiary enterprises, separate subdivisions subordinated to a single center of financial and investment activity - the parent company. They gradually became the main producers of grain products. Two thirds of agricultural holdings specialize in grain farming, and all of them are focused on exporting agricultural products and foodstuffs.

45 agrarian companies together control about 4.1 million hectares of agricultural land. And their total revenue exceeds 10.8 billion dollars. As for the gross production of agricultural holdings, in 2018 it amounted to 55.9 billion UAH, or 22% of the total volume in the country.

The growth of the number, capacity and, accordingly, the role of agricultural holdings in grain production, in our opinion, cannot be unequivocally estimated. On the one hand, having favorable opportunities for attracting financial resources, agricultural holdings are actively introducing new technologies, technically re-equipping agricultural and processing companies that are part of their structure. On the other hand, the activity of agricultural holdings leads to the growth of social

tension in rural areas, deepening imbalance of the sectoral structure of agricultural production, negative environmental consequences, so their activities should be placed under state control.

Based on the generalization of approaches, such proposals have been formulated to limit the negative impact of agricultural holdings of grain products companies on the socio-economic development of rural areas and the functioning of the agro-industrial complex of the country:

- to the Economic Code of Ukraine, providing for the separation of agricultural holding units into a separate organizational and legal group of associated enterprises;

- to introduce legislative restrictions on the size of land use, including on the principles of lease, within the authority of the village council (to 35% of the total area of agricultural land);

- remove agricultural holdings from all programs of state support of agriculture;

- for highly profitable enterprises (10 000 UAH/a) it is advisable to consider the possibility of transition to the general taxation system;

- provide for a special tax for agricultural holdings in the amount of 1% of the value of lands that are in use as a social tax for the development of rural areas, and ensure its receipt to the budgets of village councils;

- ensure effective control over observance of ecological systems of soil cultivation and grain production, introduction of scientifically grounded crop rotations.

An important place in the creation of the proper material and technical base of the grain product sub-complex is occupied by the improvement of the storage of products through the creation of mechanized and automated grain storages. In Ukraine, there is a shortage of capacities from grain storage in all regions. The problem also remains old elevators, which work inefficiently, where it is problematic to store grain of high

quality. Through improper storage of grain losses represent close to 15% of the harvest. At the same time, the quality of elevators does not meet the needs of the agricultural sector, 80% need modernization.

Insufficient and worn-out grain storage funds cause the need to build grain storage facilities with total volume up to 15 million tons, experts have calculated. At the same time, in order to build an elevator with a capacity of 50,000 tons of simultaneous storage, certified according to EU standards, investments of \$11 million will be needed. Close to 60% of the amount is spent on construction works. The purchase and adjustment of equipment is 30-35%. Another 5% of the investment will be needed for laying railway tracks. 5-10% of the amount is spent on obtaining permits and developing town planning documentation. Currently, one third of the elevator capacity in Ukraine belongs to the ten largest agricultural holdings. The company's own grain elevator is independent of market conditions and an opportunity to get the highest price for grain [4].

Almost every year, Ukrainian farmers set a new record for the gross harvest of cereals and oilseeds. In 2019, about 74 million tons of cereals were harvested, according to previous estimates. Given the lack of development of animal husbandry and processing industry, most of this crop is exported. Low prices for agricultural products predetermine the need for farmers to be able to store this grain for a long time.

Simply put, the logistics and elevator industry must match the shaft of the crop. Meanwhile, the total capacity of certified grain storage facilities - over 42 million tons of simultaneous storage - does not allow us to cope with the growing volumes of grain. The aggregate grain storage capacities in Ukraine of all types represent 78 million tons. However, elevators are located unevenly in different regions of Ukraine (Fig.1).

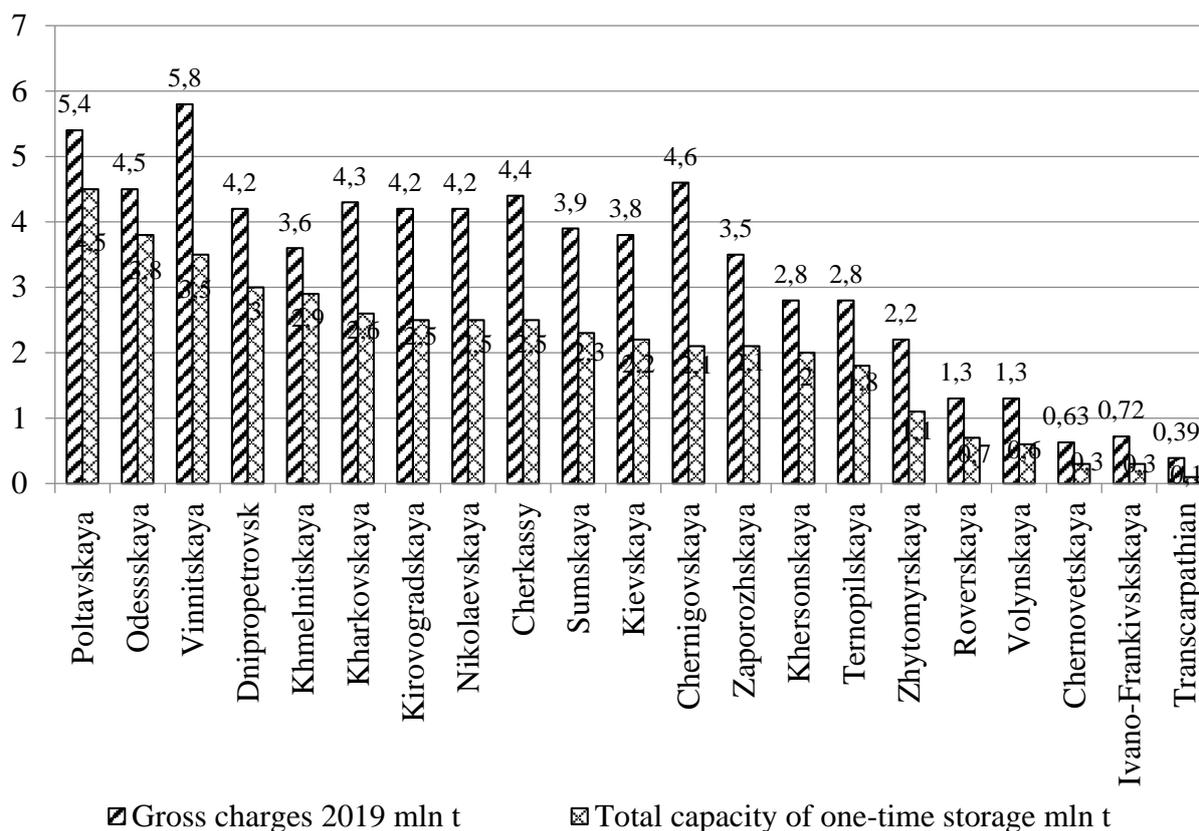


Fig.1. Cereal production and existing storage capacities by region

The need for modern grain storage facilities in 2020 reaches 70 million tons. It is expected to grow by 15-25% in the coming years.

One of the important criteria of the state and level of development of agriculture is agricultural productivity, which in general approaches reflects the output from the area of land use. Comparative analysis of 20 countries of the world behind the level of the highest yields of the main types of agriculture shows quite a significant potential of the existing opportunities for innovative increase in agricultural productivity of the domestic agricultural sector.

The domestic agricultural sector has significantly increased the agricultural productivity of land use during the last decades. However, its current level, which is characterized by average crop yields, still lags far behind the similar indicator of some countries of the world, which have achieved much better development results. This indicates a significant, but still underutilized potential to increase the agricultural

productivity of the domestic agricultural sector, which is a strategic reserve for the growth of its profitability and export opportunities.

It is clear that the efficiency of its use depends not only on resource and financial opportunities in agricultural production, but also largely on weather and climate conditions, technologies used and the level of implementation of scientific developments and innovations.

For comparison of possibilities of growth of agrarian productivity, as a rule, the indicator of an estimation of level of an average yield of cultivation of the basic agricultural crops in different countries of the world that allows more or less objective approach to the analysis of its condition and search of ways of increase is used (Fig.1). One of the most important and strategically valuable agricultural crops in the world is wheat, on the production condition of which the food security of mankind directly depends.

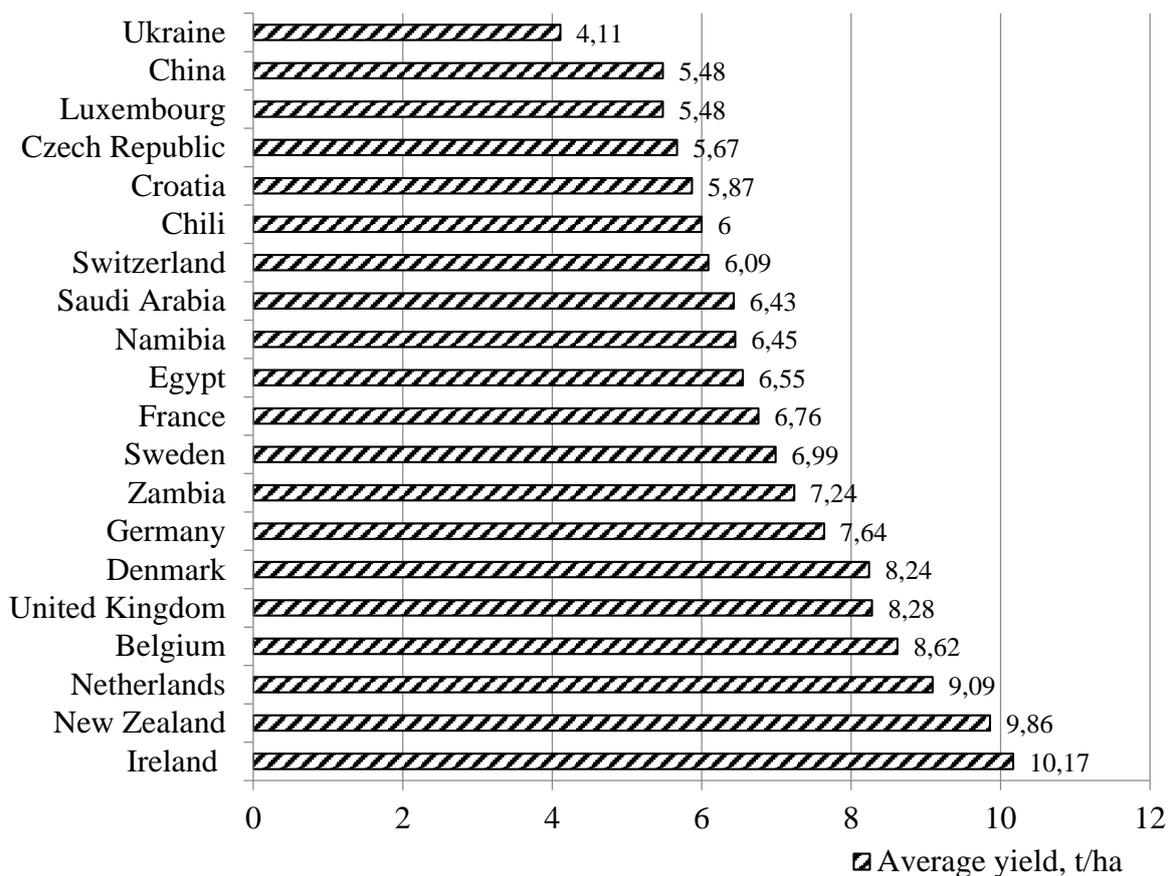


Fig.2. Average wheat yield from major cereal producers, t/ha

To reach the domestic agrarians of the specified indicators of productivity of the countries-leaders of global agro productivity completely is real in the nearest decades under conditions of carrying out of purposeful work from introduction in manufacture of new high-yielding grades and hybrids of cultures, improvement of technology of manufacture of production and protection of plants, and also observance of optimum system of their mineral food [2].

Analyzing the state of fertility of soils, we can continue to see a trend towards dehumification, intensification of erosive processes, contamination of soils with radionuclides and heavy metals. One of the main reasons for the decrease in the natural fertility of soil is irrational application of mineral and organic fertilizers at the same time increasing the rate of agricultural intensification.

An important factor in ensuring high yields of quality grain is a rational fertilizer system. According

to scientific data, part of the fertilizers in the formation of the harvest is in Ukraine - 30-40%, which is much higher than the part of seeds, plant protection products or soil cultivation. According to the assessment of domestic and foreign scientists, 1 ton of mineral fertilizers (in the active substance) on average gives yield increases from 1 hectare to 4.5 tons. For the last 30 years on our arable lands humus losses make from 15 to 40%. Decrease in humus content by 1 % leads to decrease in yield on the average by 5 centners of grain from 1 hectare.

In recent years, Ukraine has recorded a low level of application of organic and mineral fertilizers for crops, and cereals and legumes in particular. Thus, in 2018, 1.9 t/a of organic fertilizers were applied, this indicator remains almost unchanged. And mineral fertilizers were applied in the amount of 95 kg/a (Table 1).

Table 1

## Application of mineral and organic fertilizers for agricultural crops 1991, 2016 - 2018.

Index	Application of fertilizer, ths quintals				Per 1 ha field cultivated, kg				Percentage of land area, %			
	1991	2016	2017	2018	1991	2016	2017	2018	1991	2016	2017	2018
Application of mineral fertilizers by agricultural enterprises												
Under crop cultivation in total	4414,2	1728,1	2028,1	2346,3	105,1	41,7	48,9	56,5	62,9	37,8	39,8	38,8
including for cereals and leguminous crops (except corn)	1602,3	697,7	779,8	849,7	123	102	115	128	89,2	90,3	91,9	92,5
among them: corn for grain	261,6	410,7	478,8	482,5	250	130	143	147	...	93,6	93,6	94,7
Application of organic fertilizers by agricultural enterprises												
Under crop cultivation in total	260726	9162,9	9273,9	11648,9	6207,8	220,8	223,5	280,7	13,1	1,2	1,2	1,9
including for cereals and leguminous crops (except corn)	78526,9	2025,4	1873,9	2316,6	6041	294	276	350	15,4	1,9	1,9	3,3
among them: corn for grain	12562,8	2248,5	2457	2735,3	12563	726	745	834	...	3,8	3,8	6,1

[9]

If we compare these figures with those that took place before Ukraine gained its independence, there will be a significant difference: at that time, about 15 t/a of organic fertilizers were applied. For organic fertilisers, this figure was completely sufficient to completely recreate the humus. In other words, the decrease in organic fertiliser application was much more noticeable (by almost 10 times). At present, the area under fertilised organic fertilisers accounts for 3.3%. The main reason for this sharp drop was the significant decrease in the number of cattle and pigs. All this caused an aggravation of the problem with the balance of nutrients (nitrogen, phosphorus, potassium).

Annually, nutrient expenditure on crop formation is five times higher than that of soil, which reduces yields and leads to the degradation of agricultural land.

A *package* of measures to improve soil fertility should include:

- increasing the volume of application of liquid and complex mineral fertilizers, which can be produced at domestic enterprises, as well as providing a system of their storage, transportation and application in the soil;

- application of mineral and organic fertilizers in certain for effective nutrition of plants in doses, taking into account the planned yield, with the observance of the optimal ratio between nutrition elements, which are an objective necessity to ensure a deficit-free balance of nutrients and soil fertility;

- attraction of alternative sources of organic replenishment to increase the specific weight of perennial grasses, cereals spiked and legumes in crop rotations and expansion of siderat crops [3].

Under the influence of fluctuations in yields and other factors unstable is the profitability of grain production as a whole. This year's conditions, both agro-climatic and economic, differ significantly enough from previous periods. First of all, agroclimatic conditions were characterized by significant differences in daily air temperatures and increased precipitation. In terms of economic conditions, it is worth noting the decline in prices for major crops, which is traditionally observed when waiting for a high harvest. However, the general trend of recent years to reduce the level of profitability of agricultural production remains the main and most difficult problem for the development of domestic agribusiness.

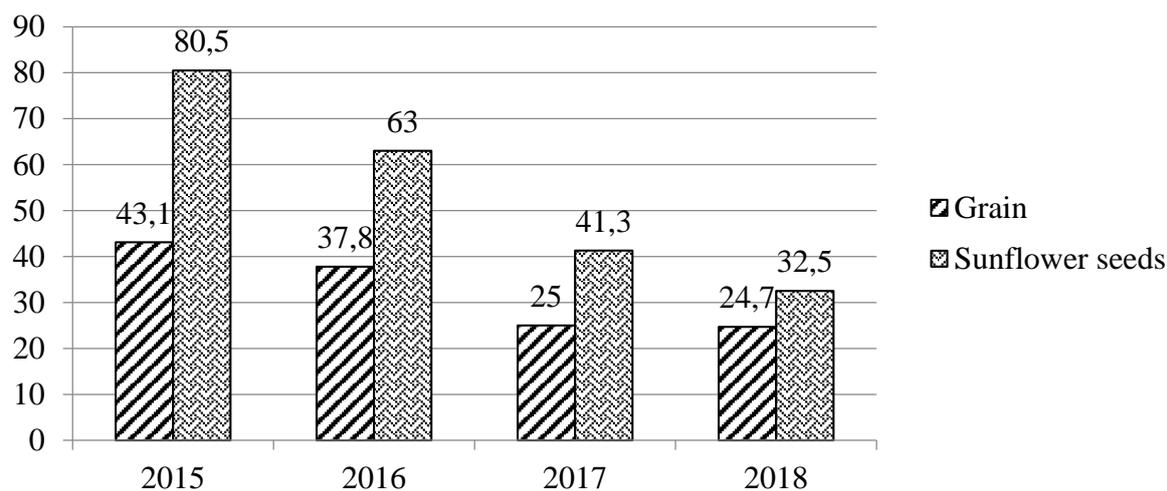


Fig. 3. Single grain profitability (grain, sunflower seeds)

As evidenced by the analysis of domestic statistics, in recent years, the level of profitability of growing main crops is steadily declining, which has a negative impact on the ability of farmers to expand the production potential and introduction of new technologies (Fig. 3).

In 2018, the average level of profitability of grain and leguminous crops production decreased to 24.7%, including wheat - 24.6%, corn per grain - 27.2%, barley - 25.6%, oats - 10.3%. Some crops in general turned out to be unprofitable. In particular, rye had a loss rate of 2.2%, while buckwheat had a negative rate of -17.2%. Never before has it had such a high level of unprofitability, while in some years its maximum profitability exceeded 100% of the threshold [9].

The emerging tendency to decrease the level of profitability of production of main cereals leads to agrarians receiving billions of hryvnias of profit and slows down the process of its technological modernization in conditions of aggravation of world competition of agrarian products and foodstuffs producers, and also does not allow to adapt the industry to climate changes effectively. Therefore, the importance and importance of state support for agriculture as a strategic tool to significantly improve the competitiveness of its products in the face of global challenges are growing [10].

In market conditions of conducting economy the urgent is the issue of economic relations of agricultural commodity producers, grain processing enterprises as the main subjects of grain market and consumers of grain products.

The development of grain market is hindered by a number of essential problems. In particular, the absence

of effective mechanisms for tracing the quality of grain and ensuring its proper storage, unprotected interests of depositors, noncompliance of legislation with EU requirements regarding the definition of quality and classification of grain and its products, as well as phytosanitary measures. Profitability of grain production for agricultural producers directly depends on efficiency of infrastructure and logistics. Restrictions on road transport and underdeveloped river infrastructure provoke a situation where the demand for rail transport is 2-3 times higher than supply. Due to delays in railcar delivery and a shortage of grain carriers, 1 million tons of grain is untimely removed from elevators, and business losses are estimated at USD 1 million. Inefficiency of grain market regulation causes \$1 million of losses to businesses every month [7].

Today, to improve the results of functioning of grain subcomplex, it is necessary to strengthen the role of state regulation of grain products market, and both supply and demand should fall into the field of influence (Fig. 4). The measures of state regulation should be oriented to the achievement of both macro-objectives (world standards of food consumption, food and ecological safety, balanced development on the innovative basis) and meso-objectives (growth of production volumes of grain products, increase of its efficiency, improvement of conjuncture of grain products market, balance of interbranch relations etc.). For grain products subcomplex the important role is not only regulation of prices, but also establishment and support of price parity between grain producers and industries, which provide its storage and processing [1].

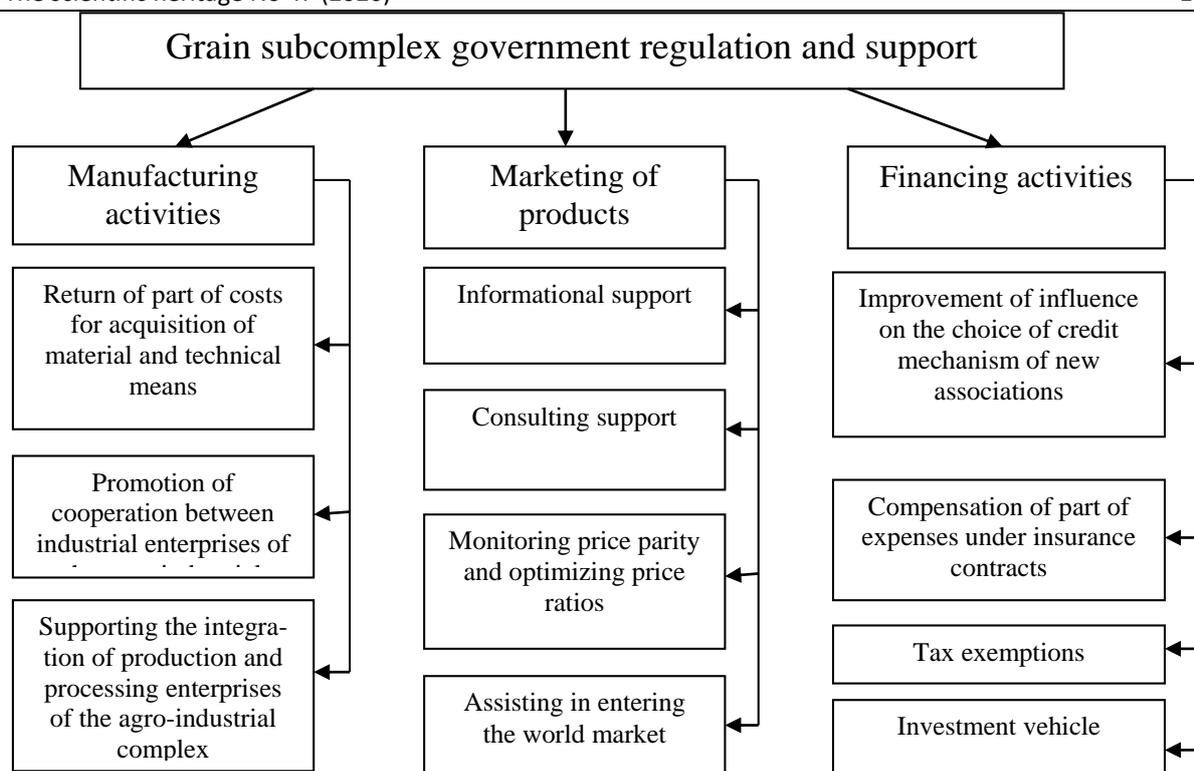


Fig. 4. Organizational and economic measures of state regulation and support of grain product subcomplex of agroindustrial complex

The deterioration of agricultural producers was also affected by changes in the structure of distribution of agricultural products and a decrease in the part of the producer in retail prices. The level of export activity of grain traders has been increasing its influence on the price situation in the domestic market. The distribution of export price between parts of marketing chain (agricultural producers, processors, trade intermediaries, etc.) is extremely uneven. At the export stage, 70% of total profits from the sale of agricultural products on the world market are formed, and the expenditure part of this link in most types of products does not exceed 20%. As a consequence, the lowest level of profitability is achieved by domestic milling and grain enterprises (0.5 - 7%), and the highest level is achieved by internal and external grain traders (20 - 30%). The revealed contradicts the general economic logic, which provides for an increase in profitability to the extent of deepening the level of processing of raw materials, and reflects the current tendency to redistribute the main income in favor of grain traders, who are managers of 88.6% of grain.

Overcoming the revealed negative tendencies pre-determines the objective need in reforming the existing mechanism of grain products management and the mechanism of income distribution between its subjects. The balanced development of the grain product subcomplex of the agro-industrial complex is the achievement of the national compromise of interests of all participants of the production and marketing system on the basis of equivalence of labor exchange and system parity [6].

Necessity is displacement from the grain market of those intermediaries who, taking away most of the

added value from grain producers, do not give the opportunity to work effectively the general logistics system of grain subcomplex. Such intermediaries divide the logistic system of the subcomplex into parts, depriving it of its integrity, prevents the equivalence of the exchange of results within the subcomplex. In this case there is no preservation of optimal product value in the process of its promotion to the end consumer, when each element of the logistics system works separately. Profit as a productive part of added value, received by intermediaries from the mentioned activity, does not go to the development of grain subcomplex and to the increase of its employees' wages. It is also necessary to improve economic ties both between the branches of the subcomplex and between the enterprises of one branch.

Strengthening of horizontal and vertical integration in the grain products subcomplex is impossible without improving the management of the mentioned logistics system. Reducing logistics costs will increase profits at the enterprises of the grain products subcomplex, and this will increase the value added [11].

The strategy of improving the management of the grain products subcomplex in modern conditions should be focused not so much on increasing quantitative indicators and export volumes, as on ensuring domestic demand for grain products, creating conditions for industrial processing of grain products, which will lead to the creation and use of additional value within the country, creation of new jobs, development of processing industries (food, bioethanol, animal husbandry, seeds), the necessary changes in the structure of grain use, in the structure of the country's economy, and in the structure of grain products.

A necessary measure is the transition of the sector to an innovative development path. It is necessary to ensure the transition to new varieties, which under the same conditions of energy and resource supply provide a third more products than the old ones. It is necessary to make maximum use of the services of territorially located research institutions, oblast state centers of plant varieties expertise and variety research stations. Implementation of the program of selection of Ukrainian varieties of wheat confectionery will provide an opportunity to produce special flour for flour sweets, and the same will contribute to the further development of the food sub-industry grain subcomplex.

The urgent task is to update the material and technical base of the industry. At the same time, additional sources of investment resources can be found as a result of improving the organizational and production structure of the sub-industry, namely: financial resources of processing enterprises, which are attracted within the framework of corporate mechanisms (association of agricultural production and processing of agricultural products); financial resources of industrial enterprises, which diversify their activities (association of agricultural and industrial capital). It is necessary to stimulate the development of leasing relations.

**Conclusions and suggestions.** Grain industry is a strategically important sector of Ukraine's economic development, forming over 25% of the total agricultural output. Low yields compared to developed countries is explained by the insufficient use of mineral fertilizers, crop protection products, violations of crop rotation, poor quality of seed material, the use of old varieties, the overall low level of logistics, which is updated very slowly. The development of the subcomplex is slowed down by the existing grain storage system, which needs to increase the number of modern grain storage facilities with high productivity of transport equipment, which makes it possible to ship large batches of bulk cargoes in a short time. The existing transport and logistics system (roads, railways, ports) does not meet the modern requirements and growing export grain flows.

Stable growing demand for grain, due to the growing number of the world's population and unstable state of food security, provides farmers with an opportunity to take stable positions in the international grain market. However, the lack of balanced state agrarian policy leads to actively growing export of raw materials (which in itself is not a negative factor), but the state's non-interference in the activation of the processes of deep processing minimizes the possibility of intensive economic development of the industry.

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