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# AGRICULTURAL SCIENCES

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## TRENDS AND BENEFITS OF CULTIVATION ORGANIC AND NICHE CULTURES IN UKRAINE

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**Abstract.** The shift towards organic technologies in the agricultural sector and their dynamic implementation, cultivation of niche cultures has opened new opportunities for domestic farmers.

Today, more and more niches arise in the agricultural sector, which are the most attractive for small producers, farm and individual farms. It is the cultivation of crops that do not require large areas, but can provide high additional profit. In addition, such activities provide an opportunity to solve various agronomic problems: to be insured against drought or to restore soil, to sow dead winter crops, to protect the environment, etc.

The example of agricultural crops amaranth has shown the advantages for small and medium agribusiness transition to attractive economically profitable niche cultures, including organic ones.

**Keywords:** agrarian sector, organic production, niche cultures, small business entities, profitability of niche cultures, export of niche cultures, organic sector.

The shift towards organic and niche production has been one of the strategic goals of the National Strategy for Agricultural Development. In order to achieve this goal, a number of tasks have been identified: completion of land reform, providing

direct state support to small and medium farmers, including the creation and development of markets, introduction and promotion of organic and niche production, implementation of food safety projects and more.

Today, the introduction of organic production technologies is very dynamic. Yes, in the last five years, the increase in organic production is 90%. None of the segments of the agro-industrial complex has such indicators. At the end of 2020, more than 460,000 hectares have been under organic cultivation in Ukraine, but according to experts, this figure could be increased several times. There were several prerequisites for this. First, in the global world, organic products have played an important role in food security. Even in countries that were very strict in protecting their markets, in the framework of international trade relations, the possibility of organic products of Ukrainian producers is not excluded, provided that the relevant certification procedures are followed. In the consumer organic market of European countries, the demand for organic products from Ukraine has exceeded the supply.

Unfortunately, there is still the problem of domestic consumption of organic products. Ukrainian producers and consumers are not as fast as they would like to realize that the production of organic products is possible, but in compliance with mandatory norms and requirements. An organic product is not just a label on a product in a store, a label, a logo or an advertising campaign. An organic product is not only useful for humans, but also safe for the environment.

Ukraine has already taken the first necessary steps to regulate this sector of the industry. In 2019, the "organic law" came into force, the issue of standardization of organic products has been worked out. Organic production is recognized as a niche in which farmers could have their added value.

Growing niche cultures is considered by experts in the agricultural sector as a mechanism to ensure business for farmers. Such activities have guaranteed additional income, the ability to insure against drought or restore the soil, replanted the dead winter and solved other agronomic problems.

Today in the world there is a reduction of areas under traditional crops and the transition to more marginal niche cultures such as chickpeas, beans, saffron,

amaranth [1]. This trend is more typical for large market operators. When choosing a crop, small farms should focus on the crop for which demand is growing steadily and will provide the greatest financial return. Therefore, in the near future the activities of small and medium-sized farms will focus on niche cultures, which include organic. Due to the fact that niche production, as well as organic, requires more effort, such crops give high profitability. Although such production has some problems due to lack of experience of farmers in this sector.

In the last few years, the search for new economically attractive crops has attracted the attention of farmers to a crop such as amaranth. Amaranth is becoming more accessible to consumers, its products appear on the shelves of Ukrainian supermarkets (chips, breakfast cereals, flour, bakery and confectionery products, baby food mixes, cereals, herbal tea from the leaves, etc.). A culture with a long history, 8,000 years ago amaranth has been cultivated by Indian tribes. Amaranth seeds were considered a kind of gold equivalent. The Aztecs have used amaranth to promote good health, its products were used in the care of newborn children, sick, were mandatory for soldiers in long and difficult campaigns [2].

For domestic farmers, this crop has been very attractive for several factors:

1) price factor - how much you can earn by growing this crop. The profitability of culture is very high. Thus, the price of organic amaranth today reaches 40 thousand hryvnias per ton. Further processing of amaranth will bring even more profit;

2) high agronomic indicators - has one of the lowest transpiration coefficients (the amount of water used to form 1 g of dry matter); very drought-resistant culture, can be effectively grown in all regions of Ukraine; grows rapidly and forms an aboveground vegetative mass up to 250 t / ha at temperatures above 30 °C. However, domestic farmers mostly sow small areas of this crop – 20, 50 or 100 hectares in order to master the new technology. 90% of enterprises in Ukraine grow amaranth using organic technology, while about 30% have organic certificates.

3) amaranth has great prospects in the food market: it is a gluten-free culture, amaranth products are very useful, because the culture naturally improves human

immunity, has an extremely rich taste; amaranth protein is considered one of the most valuable of all plants. Using a variety of finishing technologies, today amaranth has been used not as a feed crop, but as a food crop. In particular, amaranth grain has contained a large amount of fat in comparison to other plants - about 4.8%, most of which contains polyunsaturated fatty acids. In animal husbandry, amaranth has used to produce feed for farm and domestic animals, fish, seed extraction products and green mass [3].

Amaranth can be grown in all regions of Ukraine, both in the southern and central regions, and in the east, where climatic conditions allow to provide quality seeds. In wetter regions, in addition to seeds, you can get better yields of green mass.

But, among the advantages of growing this culture, there are some negative aspects. One of them is a limited market, insufficient domestic raw material base and high cost of imported high quality raw materials, including seeds.

The way out of the situation has been found in the joint efforts of amaranth farmers and processors. After the establishment of the Association of Amaranth and Amaranth Producers in Ukraine, a positive vector of development of the amaranth industry, aimed at world markets, can be clearly seen. There are climatic, natural, geographical and economic prerequisites for this:

- a sufficient number of effective temperatures for growing the most productive varieties with a long (120-125 days) growing season, the potential of which on a good agricultural background reaches 50 kg / ha;

- fertile soils allow to receive high-quality marketable seeds;

- logistical proximity to the European market;

- Ukraine is already a world leader in the number of unique implemented technologies of amaranth processing and the cost of production.

Important for the domestic export potential is the development of the market for the main product of amaranth - oil. The average cost of 1 liter in Ukraine is 40\$. For comparison, the average wholesale price of a liter of amaranth oil in Europe and America in recent years was 150-200\$, in Africa and Asia - up to 100\$. Ukraine supplies the world market less than 1% of amaranth oils from the total market. In

addition, in 2020, amaranth oil has sold for half a billion dollars worldwide, and demand growth was forecast at about 12% per year. Up to 90% of amaranth oil is used in the pharmaceutical and cosmetic industries.

Medicines with amaranth oil are extremely effective in disorders of the immune and endocrine systems, heart and skin diseases, remove toxins, radionuclides, start regeneration processes, prevent and inhibit the development of cancer. Cosmetics gently care for the skin and rejuvenate it.

Modern technologies of amaranth processing have allowed to obtain from a ton of seeds in addition to 40 liters of cold-pressed oil 350 kg of ground cereals, 400 kg of flour and cake. This made it possible to sell products worldwide at competitive prices.

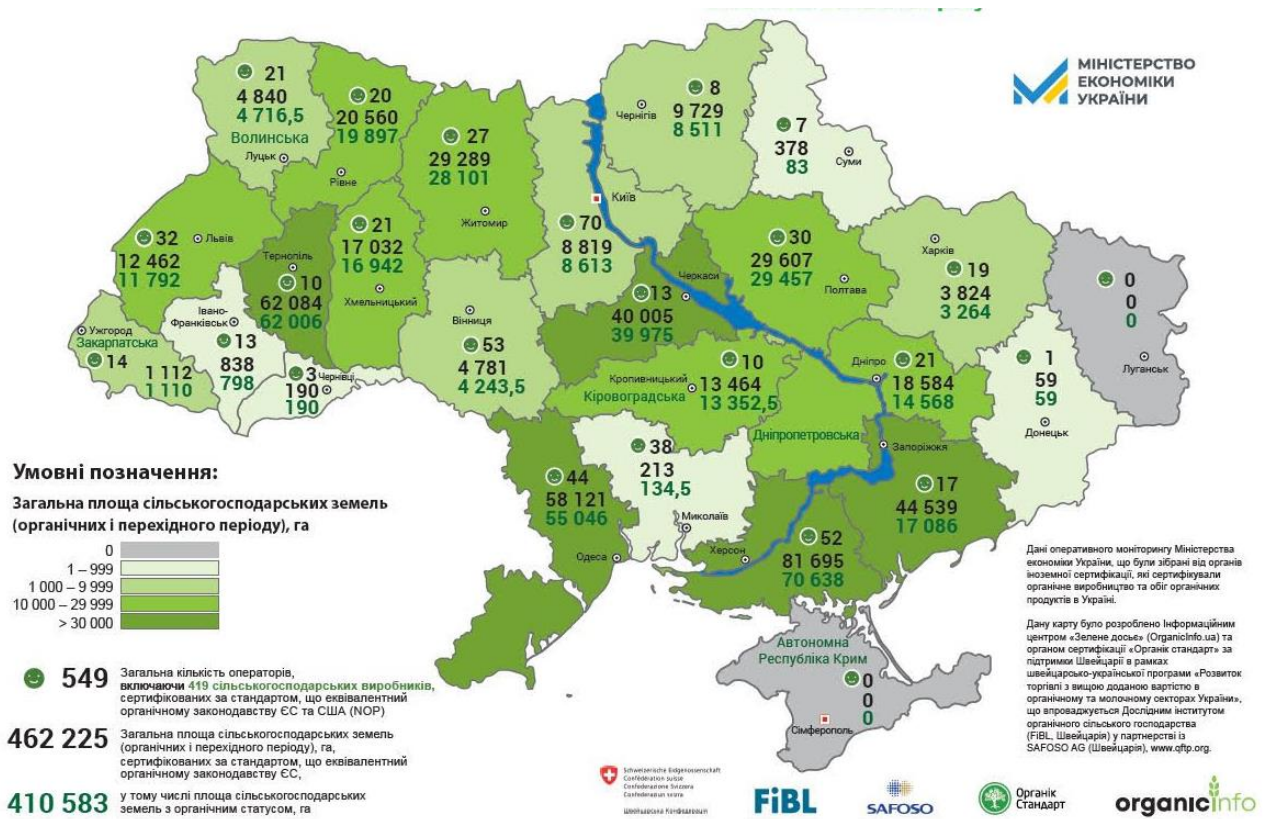
According to experts, amaranth could and should be grown according to the standards of organic farming. The combination of "organic + gluten-free + quality" has allowed you to confidently go with organic products for processing in foreign markets, especially European, which was far from the main producers of amaranth (India, Pakistan and Peru).

Today, processing enterprises have been aware of the importance of having a stable raw material base, so most of them were ready to develop taking into account the interests of farmers, offering forward contracts, concluding agreements on the intention of buying out the grown crop. This was another factor that has contributed to a balanced increase in amaranth cultivation, its processing and sales. That is, processing enterprises forecast their demand for raw materials and will buy the crop primarily from those agricultural enterprises with which contracts have been concluded. That was, processing enterprises have predicted their need for raw materials and would buy the harvest primarily from those agricultural enterprises with which contracts were concluded.

Before the full-scale military invasion of Ukraine, experts have predicted the largest increase in amaranth acreage in farms in the southern regions, where there was irrigated land, as well as in farms that have implemented organic technologies. Moreover, at the end of 2020 in the south of Ukraine there were the largest number of



certified operators of the organic market and the largest area of the agricultural land with organic status (Figure 1). The forecast applied to both small and medium-sized farms and agricultural holdings [4].



**Fig. 1. The state of organic sector of Ukraine as of December 31, 2020**

*Source: Website of the Ministry of Economy of Ukraine*

World experience has shown that the basis of the agricultural sector of countries with developed market economies were small and medium-sized agricultural producers - family-type farms. Such farms have played an important role in the production of agricultural products and remained a stabilizing link in the economy, which compensated for the decline in agricultural production at some agricultural enterprises. They have provided for the food needs of the population and the income of the peasants.

Domestic farmers considered amaranth a unique, cost-effective and profitable crop to use. Today, more than twenty domestic companies have bought an unlimited number of commercial amaranth seeds and produced a variety of products that have

found their consumers in Ukraine and exported to the United States, the EU, the United Arab Emirates, Israel, Georgia and Kazakhstan.

In terms of healing power, amaranth could be compared to ginseng and golden mustache. It was superior to all plants in nutritional value. The Food and Drug Administration of the United Nations has recognized amaranth as a culture of the XXI century.

According to the World Food and Agriculture Organization (FAO), family farms, the most common form of rural management, have produced more than 51% of the world's crop production. In European countries, family and self-employed forms of management in rural areas dominated in almost all sectors of agriculture. The farm-type enterprise has had ecological functions, because the farm was both a place of work and the territory of residence of its owner. Such households, in their vast majority, are engaged in the development of niche areas, including the production of organic products.

Today, small and medium-sized agricultural producers could not compete with large agricultural holdings in the market of organic products due to their technological features, including the ability to purchase and sell, certification of organic products, exports and more. However, the "organic" sector could be a great business option for them, where they could be competitive. With the increase in domestic consumption of organic products, due to the change in domestic culture, improved legislation and state support for producers of niche cultures, including organic products, they would definitely increase their export potential.

Today, regional programs to support small and medium-sized businesses are being implemented at the level of definite regions, aimed at supporting farmers in the direction of organic production. In addition, the Cabinet of Ministers was considering the adoption of a program to support the organic production of at least 1% of gross agricultural production, according to which farmers who would be engaged in organic production would have priority in obtaining additional funding from the state.

It has been important to note that in order to successfully produce niche cultures, including organic crops, farmers should be focused on product quality, not

quantity. They would be able to provide the number and, consequently, large consignments for export by merging into cooperatives or associations. The sooner Ukrainian manufacturers of niche cultures have started to unite, the sooner they would be able to enter foreign markets. Then every farmer would receive a fair and stable income for the production of a quality product.

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