

ORGANIC PRODUCTION (ОРГАНІЧНЕ ВИРОБНИЦТВО)

Бойчук Р.В. – здобувач вищої освіти групи А3/2

Науковий керівник: Ракова А.Ю., викладач кафедри іноземних мов МНАУ

У статті розглядаються питання основ органічного виробництва та його впливу на навколишнє середовище при вирощуванні сільськогосподарських культур.

Ключові слова: Органічне виробництво, сільське господарство, агрономія, культури, врожай, органічні речовини.

The article deals with the basics of organic production and its impact on the environment when growing crops.

Key words: Organic production, agriculture, agronomy, crops, harvest, organic substances.

MAIN ASPECTS OF ORGANIC AGRICULTURAL PRODUCTION

ORGANIC PRODUCTION is a certified activity related to the production of agricultural products (including all stages of the technological process, namely: primary production (including harvesting), preparation, processing, mixing and related procedures, filling, packaging, processing, recovery and other changes in the state of the product), which is carried out in compliance with the requirements of the legislation in the field of organic production, circulation and labeling of organic products. [1]

ORGANIC VEGETATION - organic production related to the cultivation of cultivated plants, as well as the harvesting of flora in compliance with the requirements of the legislation in the field of organic production, circulation and labeling of organic products. Growing grain, industrial and fodder crops using such technologies has significantly increased the yield and gross harvest of grain, sunflower, sugar beet, corn, etc. However, in order to realize the biological potential of the crops grown, high agro backgrounds and reliable protection of plants from harmful organisms such as weeds, pests and diseases are required. As a result, the consumption of resources and energy has increased, and a number of environmental problems have arisen related to maintaining and expanding soil fertility, and pollution of the industry's products and the environment. The unbalanced use of mineral fertilizers has resulted in agrophysical soil degradation, which is a decrease in their potential and effective fertility. The interaction of mineral fertilizers with the soil, if the optimal ratio between the amount of organic and mineral fertilizers applied is not maintained, leads to the displacement of calcium ions and other divalent cations from the soil absorption complex. [1]

Under these conditions, humus dispersion, increased mineralization, and soil dehumidification occur. In order to avoid these negative phenomena, the search for alternative farming systems has begun. The objective direction of this search was the greening of the industry, which includes environmentally sound elements of the farming system (organic). The global community's awareness of the growing environmental threat posed by intensive farming has stimulated the development of alternative management models that better meet the vital interests of society. Organic farming has become such a model, which has recently been providing the growing global market with certified, healthy, safe food. The term "organic farming" refers to agricultural practices without the use of synthetic pesticides and fertilizers. However, this is a characteristic rather than a definition of this system of agricultural production. This system is based on crop rotation, the use of crop residues, manure and compost, legumes and plant fertilizers, organic waste, minerals, mechanical tillage and biological pest control to increase fertility and improve soil structure, provide adequate plant nutrition and control weeds and various pests. Therefore, organic production is a holistic system of farming and food production that combines the best practices in terms of environmental protection, biodiversity, conservation of natural resources, high standards of

animal welfare and a production method that meets certain requirements for products made using substances and processes of natural origin. Thus, the organic production method plays a dual social role: on the one hand, it provides a specific market that meets the needs of consumers for organic products, and on the other hand, it provides a common good by contributing to environmental protection, proper animal welfare, and rural development. The share of the organic agricultural sector is growing globally due to the increasing demand for these products. In Ukraine, which is a global supplier of agricultural products and plays an important role in ensuring a sustainable food system and food security in the world, organic production began to develop actively in the early 2000s. Since then, Ukraine has been considered one of the most important suppliers of organic products to the EU market. For many years, Ukraine has remained a reliable supplier of organic products and maintained its position during the COVID-19 pandemic, when supply chains were disrupted. The pandemic has also shown that demand for organic products will continue to grow globally, as more and more consumers choose a healthy lifestyle and quality food. In recent years, Ukraine has been confidently ranked among the top 5 largest suppliers of organic products to the EU. [1]

In 2020, Ukraine ranked 4th in the world out of 123 countries in terms of imports of organic products to the EU with a share of 7.8%. In 2020, Ukraine exported 217210 tons of organic products to the EU. The key groups are corn, wheat, soybeans, sunflower oil, rapeseed, oilcake, sunflower seeds, blueberries (frozen), berries, and millet. In 2020, Ukraine's total exports of organic products amounted to 332 thousand tons worth about USD 204 million. Due to the introduction of the European Green Deal, organic production is one of the flagship initiatives in the transition to sustainable agriculture in Ukraine. Growing organic crops has certain peculiarities that require a more detailed study. The basis of the organic farming management system is proper soil fertility management, selection of species and varieties, long-term crop rotation, reuse of materials and appropriate tillage technologies, and prohibition of the use of genetically modified organisms and their derivatives. The use of additional fertilizers, soil improvers and plant protection products is only allowed if they are compatible with the goals and principles of organic production. Organic agricultural production should be based primarily on renewable resources within individual agricultural units. Organic crop production should help to preserve and improve soil fertility and prevent soil erosion. Plants should receive nutrients primarily through soil ecosystems, rather than through soluble fertilizers applied to the soil. For this reason, considerable attention should be paid to the training of highly specialized specialists in the field of organic crop production. This publication contains materials for mastering theoretical skills and practical techniques for developing modern elements of field crops cultivation technologies in organic production based on in-depth knowledge of the biological characteristics of crops, taking into account the peculiarities of plant growth and development, and familiarization with the most widely used technologies in the crop industry in the world and in Ukraine. Against the backdrop of the war in Ukraine, the EU is introducing new measures to strengthen food security. In particular, on March 23, the European Commission presented a number of short- and medium-term measures to improve global food security and support farmers and consumers in the EU due to the rise in food prices and costs of raw materials such as energy and fertilizers caused by Russia's military aggression in Ukraine. The proposed measures are aimed at increasing the resilience of supply chains in the EU agriculture and food sector in line with the Farm to Fork strategy. According to the Resolution of the Cabinet of Ministers of Ukraine dated 3.03.2021 No. 179 "On Approval of the National Economic Strategy for the period up to 2030", Ukraine's goal of 3% of land under organic production for growing crops whose products will be used directly for human consumption - cereals, legumes, vegetables, fruits, grapes, berries, medicinal plants, nut-bearing plants, etc. The use of industrial inputs is not allowed. Organic farming systems are aimed at producing high-quality products that are safe for humans. They will be introduced in specialized farms for growing the relevant crops. They will be based on natural biological means of reproducing soil fertility and protecting agricultural plants from pests. They should be environmentally safe, adapted to the relevant soil and climatic conditions of Ukraine, highly productive and soil-protective. Supporting organic production in Ukraine and implementing the measures envisaged in the Farm to Fork and Biodiversity strategies can ensure the

sustainability of overall agricultural productivity. Ukraine has significant potential to produce organic agricultural products and sell them through exports, and in the medium term, to supply the domestic market. At the same time, organic agriculture will contribute to solving a number of urgent problems that exist in agricultural production in Ukraine and its rural areas. [1]

BASIC PRINCIPLES AND CONCEPT OF ORGANIC AGRICULTURE

The concepts of "organic agriculture", "organic farming", "organic production", and "organic farming" are defined as related. Given that agriculture already includes production and farming, it is worth considering these categories as a whole. As a rule, the definition of the essence of "organic" concepts appeared during the adoption of laws, standards, regulations, etc., with the United States and Europe being the most active in the development of organic agriculture at the legislative level. In 1988, the U.S. Department of Agriculture launched an education and research program on low-input agriculture. [1]

Since 1999, the program has had a different focus and has been called the Sustainable Agriculture Research and Education Program (SARE). [1]

Alternative farming methods are an important component of sustainable agriculture. Scientific research on this issue is conducted, in particular, by the International Federation of the Organic Agriculture Movement (IFOAM), founded in 1972. It was this organization that coined the term "organic farming" and defined the principles of organic agriculture. In 1980, a group of organic farming researchers in the United States proposed a definition: "Organic agriculture is a system of agricultural production that prohibits or greatly limits the use of synthetic compound fertilizers, pesticides, growth regulators, and food additives to feed for feeding animals. This system is based on crop rotations, the use of crop residues, manure and compost, legumes and plant fertilizers, organic waste, minerals, and mechanical tillage and biological pest control to increase fertility and improve soil structure, provide adequate plant nutrition, and control weeds and various pests." The global organic market is developing rapidly. The introduction of organic agriculture, which is based on maintaining and improving the health of soil, plants, animals and humans as a single and indivisible whole, based on the principles of natural ecological systems and is preventive in nature to protect the health and well-being of current and future generations and the environment, is becoming increasingly important. This is evidenced by the growth of the global organic agricultural market (almost 106 billion euros in 2019), the increase in the area under organic production, and the interest and growing demand among the population. [1]

In 1980, France became the first country in Europe to adopt national legislation on organic agriculture. The first legislative standard regulating organic production was also adopted in Austria in 1985, and later they were approved in other countries, which led to the adoption of the EU Council Regulation No. 2092/1991 in 1991 (the first organic law in the EU), i.e. the introduction of common European legislation. Since then, we can talk about the emergence of a unified and regulated definition of organic production at the international level. The second law, Commission Regulation (EC) No. 889/2008, came into force in 2009. According to this regulation, "organic agricultural production (using only organic fertilizers) means a system of management where agricultural products are grown without the use of synthetic fertilizers, pesticides, and growth stimulants." As of January 1, 2022, the new Regulation of the European Parliament and of the Council (EU) No. 2018/848 (the third law is the original in English or an overview of the main points in Ukrainian) on organic production and labeling of organic products came into force in the EU. In addition, the EU Commission has defined the equivalents of organic agriculture to harmonize terminological differences in the regulations of the next Regulation. Thus, in England and Malta, it is called organic, in Bulgaria, the Netherlands, Greece, Italy, Latvia, Portugal, France - biological, in Denmark, Estonia, Spain, Lithuania, Germany, Poland, Romania, Slovakia, Slovenia, Hungary, the Czech Republic, Sweden - ecological. [1]

The terms that are quoted and used in different EU countries (organic/ecological/biological), given the definition in Ukraine, actually mean "organic" and are fully protected in the EU. In accordance with the decision of the General Assembly of IFOAM (International Foundation for Organic Agriculture Movements), in June 2008, an official definition of organic agriculture was adopted, according to which "organic agriculture is a production system that supports the health of

soils, ecosystems and people. It depends on ecological processes, biodiversity and natural cycles specific to local conditions, while avoiding the use of harmful resources that cause adverse effects. Organic agriculture combines tradition, innovation and science to improve the environment and promote equitable relationships and an adequate standard of living for all of the above." Organic production in Ukraine is also developing rapidly. There are 635 registered operators on the Ukrainian organic market, 501 of which are agricultural producers. Organic agricultural land covers 309,100 hectares, which is 0.7% of agricultural land, almost doubling since 2002. Ukraine also has its own organic legislation, which is based on the EU organic regulation, but is not completely identical to it. According to the Law of Ukraine No. 2496-VIII of 10.07.2018 "On the Basic Principles and Requirements for Organic Production, Circulation and Labeling of Organic Products"[1]

Thus, the purpose of organic farming is: Organic farming methods involve a complete rejection of the use of synthetic mineral fertilizers and synthetic plant protection products, emphasize the preservation, conservation and activation of natural regulatory organisms (birds, beneficial insects, ticks and microorganisms). It is also important to use methods alternative to chemical ones, such as mechanical, agrotechnical, biological, genetic, biotechnical, immunological, and other methods in plant protection. In modern organic agriculture, various methods of management are used, which are generalized in the historical perspective. It is worth noting that all over the world today, the organic sector is the only formally regulated type of agriculture based on integrated sustainability. [1]

ADVANTAGES OF ORGANIC AGRICULTURE

Environmental benefits:

- Reducing the level of anthropogenic impact on the environment as a result of agricultural activities;
- preservation and restoration of agricultural soil fertility;
- prevention of land degradation, soil acidity and salinity;
- preservation of biodiversity and the genetic bank of plants and animals, rejection of monocultures, and natural conditions for keeping animals;
- active use of agricultural genetic resources, including insects and microorganisms;
- increasing the diversity of wild flora and fauna;
- promoting a better combination of habitats adjacent to agricultural land;
- Reducing the risk of erosion by increasing the amount of humus, physical stability, and ability to use water;
- Increasing the level of biological activity, increasing the amount of biomass, organizing nutrient recycling, improving soil structure;
- utilization of the potential of symbiotic processes;
- reducing the alkalization of ground and surface water by eliminating the use of synthetic plant protection products;
- purification of drinking water sources from toxic chemicals;
- Reducing the level of nitrogen leaching;
- reduction of greenhouse gas and reactive substances emissions;
- Increasing the rate of carbon dioxide sequestration in the soil;
- Reduced use of direct energy (flammable substances, lubricants) and indirect energy (fertilizers and pesticides) for organic areas;
- Increasing the efficiency of energy use in accordance with the amount of extracted or produced product;
- prevention of climate change;
- combining the conservation of wildlife biodiversity, agricultural biodiversity, and soil conservation. [1]

Economic benefits:

- introduction of resource-saving technologies and technical means, reduction of energy intensity of agricultural production;
- development of local markets for organic products through the creation of small farms;
- additional development of the processing sector for organic products;
- promotion of rural green tourism in environmentally safe areas;
- independence from industrial chemicals;
- harmonious combination of crop and livestock production;
- significant reduction of production costs and dependence on external financing (in the medium and long term);
- increase in yields (in case of long-term use);
- increase in the use of renewable resources;
- improving the quality and competitiveness of Ukrainian agricultural products on domestic and global markets. [1]

Social benefits:

- Increased life expectancy and improved health of the population;
- Increasing the level of education of the rural population;
- Improving the welfare of the population through diversification of activities, increased employment and development of rural areas;
- protection of consumer rights;
- Ensuring innovation in the development of organic agricultural production;
- shaping the environmental image and rating of Ukraine;
- ensuring food security of Ukraine.
- preservation and support of small farms;
- improving the scientific and technological level of the agricultural sector;
- providing the population with high quality, environmentally friendly and safe certified organic food and other goods. [1]

The basis of the organic crop management system in the world is:

- Due management of soil fertility;
- selection of species and varieties;
- long-term crop rotation;
- recycling of materials;
- appropriate soil cultivation technologies. [1]

Organic (ecological, biological) agriculture is a form of farming that deliberately minimizes the use of synthetic fertilizers, pesticides, plant growth regulators, and feed additives. On the contrary, the effect of crop rotations, organic fertilizers (manure, composts, crop residues, green manure, etc.), various methods of soil cultivation, etc. is more actively used to increase yields, provide cultivated plants with mineral nutrients, control pests and weeds. [1]

In accordance with part two of Article 13 of the Law of Ukraine "On Basic Principles and Requirements for Organic Production, Circulation and Labeling of Organic Products", the Cabinet of Ministers of Ukraine approved the Procedure (detailed rules) for organic production and circulation of organic products. The governmental resolution provides for the establishment of detailed rules for organic crop production, livestock, mushroom farming, aquaculture, production of organic seaweed, organic food and feed, harvesting of organic plant objects, as well as the specifics and application of exceptions, parallel and simultaneous production, storage, transportation and labeling of certain types of organic products. The Resolution aims to ensure the proper and efficient functioning of the organic market, as well as to create transparent conditions for conducting business activities in the field of production and circulation of organic products. The new rules for conducting business activities in the field of organic crop production will reduce the level of air, water and land pollution by synthetic substances, including agrochemicals and pesticides. Organic

farming must meet the requirements of the selected production standards. The Law of Ukraine "On the Basic Principles and Requirements for Organic Production, Circulation and Labeling of Organic Products" sets out detailed rules for organic crop production. [1]

WHY IS ORGANIC PRODUCTION IMPORTANT FOR HUMANS AND NATURE, AND WHAT ARE THE BENEFITS OF INTRODUCING ORGANIC PRODUCTION?

- For humans

Organic products do not contain GMOs, trans fats and other toxic compounds. Farmers in organic farms do not use traditional pesticides and fertilizers, and animals grow without the constant use of antibiotics and growth hormones. As you know, if these substances constantly enter our bodies, they cause many diseases. [2]

In addition, when animals and plants grow naturally, the amount of vitamins and antioxidants in products increases significantly. Therefore, organic production creates not only safe products, but also healthy ones. We can even taste the special rich flavor of such food. [2]

- For nature

Organic production is constantly improving, and producers are trying to reduce the harmful impact of their farms on nature. To do this, farmers maintain and restore soil fertility, take care of the welfare and free growth of animals, and do not use chemicals that could pollute water bodies. Thanks to these efforts, people, animals, and plants near farms live in safety.

Conventional agriculture causes huge emissions of greenhouse gases such as nitrogen oxide, methane, and carbon dioxide, which exacerbates climate change on the planet. Organic farms produce significantly less greenhouse gases. According to IFOAM (International Federation of Organic Agriculture Movement), if we fully switch to organic farming by 2030, it is possible to offset 20% of greenhouse gas emissions caused by agriculture. And this is a huge contribution to the fight for climate preservation. [2]

- For producers

In the Western world, profits from organic farms are steadily increasing. Prices for organic products are higher than for conventional ones, and consumers are willing to pay more for quality and naturalness. And this is just the beginning. Currently, not all Ukrainians are aware of the benefits of organic products, but as awareness grows, demand will increase.

Creating economic benefits for farmers is an important part of organic farming development programs in Europe and Ukraine. European programs plan to realize the idea of "organic on everyone's table" by 2030 and are funded accordingly. [2]

- With thoughts of the future

Each of us has a powerful weapon in our hands - our choice. Corporations are competing for it, and marketing agencies around the world are creating state-of-the-art advertising to win the favor of consumers. By choosing organic, we not only protect our health, but also call on the whole world to take care of the planet. [2]

Література:

1. "Fundamentals of organic crop production" - V. Pindus O. Hutsalenko, S. Omelchuk, L. Vasylenko, S. Horban

OrganicInfo information portal URL: <https://organicinfo.ua/> [1]

International Federation of Organic Agriculture. URL: <http://www.ifoam.org/> [1]

Modern trends in the formation of the principles of organic agriculture / O.G. Minkova // Bulletin of the Uman National University of Horticulture. 2015 - No. 1 - P. 16-21. [1]

Research Institute of Organic Agriculture URL: <https://www.fibl.org/de/> [1]

Official website of the magazine "Organic ua". URL : <http://organic.ua/uk/organicworld/how-to-choose> [1]

Official website of the BTU-Center company. URL: <https://btu-center.com/integr/organic/> [1]

Official website of the International Federation of Organic Agriculture Movement URL: <http://www.ifoam.> [1]

Council Regulation (EC) No. 834/2007 of June 28, 2007 on organic production and labeling of organic products and repealing Regulation (EC) No. 2092/91 URL: https://organicstandard.ua/files/standards/ua/ec/EU%20Reg_834_2007%20Organic%20Production_UA.pdf [1]

On the basic principles and requirements for organic production, circulation and labeling of organic products: Law of Ukraine of 10.07.2018 No. 2496-VIII URL: <http://zakon.rada.gov.ua/laws/show/2496-19> (accessed on November 5, 2019). [1]

How to switch to organic farming? Agribusiness today. URL : <http://agrobusiness.com.ua/agro/ideitrendy/item/8378-iak-pereity-na-orhanichne-zemlerobstvo.html> (accessed on April 21, 2016). [1]

https://organicstandard.ua/files/inputs/ua/OS_TABL_2017.pdf [1]

https://www.poettinger.at/img/landtechnik/newsletter/bodendruck_gross.gif [1]

https://www.poettinger.at/uk_ua/Newsroom/Artikel/11213/ [1]

2. <https://organicinfo.ua/why-organic/>