Innovative technologies and problems of ecological Agriculture of Russia

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Abstract. The modern history of organic farming in Russia began in 1989 with the implementation of the state program "Alternative Agriculture". Organic agriculture in Russia was initially considered as a condition and mechanism for the development of small and medium agricultural forms of production. The increase in the production of agricultural products and food in excess of the normative requirements, ensuring the country's food security led to the expansion of exports. Russia's aptitude to uphold fulfillment with global standards and be competitive in world markets where ecologically clean agricultural products are in demand is quite high: huge reserves of land in Russia, the introduction of ecological farming systems must be carried out on large areas, coordinated with a large number of small owners. Information support for farmers about new, more efficient technical means, biotechnologies in organic agriculture and certification of organic products for environmental friendliness, safety of manufactured products, the use of intensive biotechnologies, financial support of organic agriculture, processing and sale of organic products remain problematic.

1. Introduction
The food market in modern conditions shows a clear priority in the way of the growth of the organic sector, which is due to many reasons. This is the uncertainty of the possible consequences and mistrust of genetically modified products; perceived danger to human health of mass-produced products; negative attitude towards traditional products due to recent epidemics (mad cow disease, bird flu, foot and mouth disease, etc.); a deployed information campaign aimed at promoting environmentally friendly products and others. [1,2].

2. Research methods
The theoretical and methodological basis of the study amounted to works of domestic and foreign scientists on problems of agricultural production; development of land relations; research and recommendations of the Russian Academy of agricultural sciences of the Russian Federation, laws, presidential decrees and orders of the Government of the Russian Federation, normative-legal acts of the constituent entities of the Russian Federation, the EU regulation on the development of ecological agriculture, IFOAM standards. Methodological framework served as a systemic approach allowing to ensure comprehensiveness and focus.
3. Analysis results

The learn of the knowledge of farming production show that the growth of agriculture in the countries of the earth group of people is more listening carefully on the natural manufacture of environmentally friendly, safe for human health products, which improve the quality and survival expectancy of the inhabitants [1,2,3,4,5]. Scientists and practitioners are working on issues of organic agriculture. Discussions carry on, preliminary with the terms used in investigate and do of natural farming, resource possible and technology of natural undeveloped [7,9,10,11,12]. Back in 1924, Rudolf Steiner came up with the concept of biodynamic farming, which became the forerunner of organic farming. For the first time the term "organic farming" was used by Lord Northbourn (Walter Ernest Christopher James) in 1940. In the development and popularization of the concept, such people as Albert Howard, Yves Balfort, Jerome Irving Rodale played an important role. Yves Balfort in 1939 laid the Hagley Experiment, in which "conventional" and organic farming was conducted for more than 40 years in different fields of one farm for the purpose of their comprehensive comparison [5,21].

The components and efficiency of ecological agriculture are presented in figure 1. We regard biological agriculture as a dynamic method of management, the main idea of which is to conduct agricultural production in accordance with the laws of nature.

The systematic development of the organic sector of agricultural production takes place in America, Canada, the countries of the European Union, Australia, China, and Japan. According to a report by the International Federation of Organic Agriculture Movement (IFOAM), agricultural producers in more than 130 countries around the world are adopting organic farming methods alongside traditional farming systems. Asian countries are ranked third in the ranking of organic farming countries in terms of land area devoted to organic farming. The main consumer of organic products today is the European Union, where the bulk of sales falls on Germany. The physiological value and safety of food is the main criterion for consumers who are inclined to pay a higher price for it.

The resulting confrontation among the undeveloped division and natural world necessitate the change of undeveloped manufacture to a qualitatively novel height, which presuppose the adaptation of technology to organic methods of management, natural and ecological conditions of the area and the environmental requirements of the produced food. Further formation and development of social production dictate the need for an indispensable consideration of environmental factors and principles. At the same time, it is necessary to search for the latest trends in the field of rational nature management, based on the maintenance of basic conditions that are significant for the life of human society and social production - clean air, water and soil resources, and neutralize the possibility of depletion of these resources. Objectively, there is a need to develop the concept of ecological and economic balance. The basis of organic agriculture is to minimize the use of synthetic and chemical fertilizers and plant protection products. At the same time, it is noted that the technology of organic agricultural production does not guarantee the complete absence of residues of chemical components in the products produced, which is caused by the general background pollution of the environment. Therefore, the main goal of organic agricultural production is to improve the quality and production characteristics of interdependent soil, plants, animals and people.

According to a study by scientists from the Gorno - Altai University [4, 30], the ecological state of the Altai water basin is predominantly favorable (figure 1).

In recent years, the Altai Territory has steadily occupied the 3rd place in the Ecological rating of the constituent entities of the Russian Federation, giving way in 2020 to the Belgorod Region Settlement period 01.06.2020 - 31.08.2020.
4. Research result

The ecological safety of life of the population presupposes an integrated approach to solving the problems of environmental preservation and ecosystem management of production processes and nature management [11]. In our opinion, the main difficulties in the development of ecological agriculture are:

- a change in the way of thinking - in the return to crop rotation, keeping, treatment of animals, the very approaches to agricultural production;
- the lack of specialists (staff shortage) [12], while the creation of training programs for personnel, bachelor's and master's degrees for organic agricultural production on the basis of agricultural universities and institutions of additional vocational education, the creation of competence centers and a system of consulting on organic agriculture on the basis of the structures of the Ministry of Agriculture of the Russian Federation, the inclusion of the fundamentals of organic agriculture in the main professional educational programs of agricultural universities, the inclusion in the plans of research activities of agricultural universities and the All-Russian Research Institute of scientific research in accordance with international EU standards. No less relevant will be the adoption of comprehensive targeted research programs in the field of organic farming (varieties, biological products, biofertilizers, machinery, agricultural technologies, etc.) on the basis of existing certified organic farms, agricultural universities and the All-Russian Research Institute [13-19];
- the presence of a large number of counterfeit products under the brands "organic", "bio", "farm products" and others;
- a low level of knowledge in organic products in almost all target groups - agricultural producers,
authorities, science, which is misleading, creates confusion in concepts, inadequate expert assessment and proposals;

- high cost to market. The transition to organic animal husbandry is carried out within 1-3 years, while during the transition period the products do not yet have the status of organic and cannot be sold with added value. The cost of certification according to organic standards is from 300 thousand rubles per farm. It is necessary to confirm the certificate every year at the same cost;
- the complexity of control - one mandatory control and two without warning. Although organic production should be carried out with a deep conviction about the protection of nature, and at the stage of enthusiasts, control serves rather a formal function;
- insufficient production culture, morally outdated agricultural practices.

Ecological agriculture is not possible without the use of bio-intensive technologies, which, however, should not contradict organic legislation. The main biotechnological techniques in ecological (organic) agriculture should include, in our opinion:

- the use of probiotics and prebiotics in the feeding and treatment of animals,
- the use of approved bio-preservatives for the preparation of feed,
- obtaining and using dosage forms of drugs for the prevention and treatment of diseases, to improve the immune status of animals,
- use of enzymes for feed production,
- study of chemical and physical methods of processing feed to increase their nutritional value - dispersion, cavitation, malting, fermentation, etc. These methods allow you to extract nutrient reserves from feed without additional enrichment with chemicals. For example, the use of a feed preparation device based on a dismembrator, which has been tested in the farms of the Altai Territory and Mongolia on the basis of the effect of hydrodynamic dispersion, allows the free sugars contained in grain feeds to be released due to starch hydrolysis, thereby optimizing the sugar-protein ratio [17].

The key directions for the formation of regulatory and legal relationships in the field of organic livestock farming in the regions and countries of the Greater Altai are:

- development of approaches to the formation of a regulatory framework within the framework necessary to ensure the development of a single market for organic livestock products, as well as increase its export potential,
- studying the feasibility of developing a draft agreement on the circulation of organic livestock products within the framework of relations between Russia and Mongolia,
- formation of a coordinated coordinated agricultural policy in the field of organic animal husbandry,
- formation of the necessary regulatory framework and the establishment of general requirements for the production of organic livestock products, harmonized with the international IFOAM standards, which will ensure the free circulation of organic products within the regions and countries of the Greater Altai,
- mutual recognition of the results of confirmation of the compliance of organic products with the requirements of national (regional, international) standards in the field of organic agriculture,
- formation of a unified register of producers and certification bodies for organic livestock products,
- unification of requirements for the labeling of organic products when circulating within the framework of the Russian-Mongolian Union,
unification of requirements for imported and exported organic products in foreign trade with third countries,
interdependent measures of state support for organic animal husbandry,
measures to support the export of organic livestock products,
determination of the direction of joint research work in the field of organic animal husbandry on the basis of agricultural universities within the framework of international scientific cooperation,
information and consulting support for the development of organic animal husbandry within the framework of relations between regions and countries of the Greater Altai.

5. Conclusion
The main prospects for the development of bio-intensive technologies in ecological (organic) agriculture are, in our opinion:
the need to conduct research to study the requirements for organic products,
analysis of regulations governing the production of livestock organic products,
determination of territorial and regional specialization of agricultural production for obtaining organic products in the region,
development of plans for effective agro-technological measures,
development of organic fodder production, including the development of proposals for the placement of fodder crops in microzones of territories for obtaining organic livestock products,
development of technologies for processing organic products - in order not to turn into a raw organic appendage of the EU countries and the USA with developed organic production,
improving the structure of forage areas within the framework of the production of organic products, the formation of crop rotations for forage crops,
creation of breeds adapted to organic animal husbandry with high immunity, including the use of Mongolian cattle,
development of technologies for organic animal husbandry, taking into account the existing climatic, demographic, forage, epizootic and other conditions,
search for feed products and additives of natural origin that increase the efficiency of organic animal husbandry,
maintenance of natural biodiversity. It has been proven that organic agriculture improves the ecology of the region through the use of long-term crop rotations, the inclusion of many crops in the production process, increases soil fertility and improves the quality characteristics of products, increases the biodiversity of birds. In this regard, and proceeding from the ecological and economic feasibility, we have proposed bringing eco-system management to the level of small villages, farms through the formation of micro-clusters, eco-clusters of rural areas on the principles of cooperation and business-administrative partnership.

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