

# Efficiency of Use of Innovations in Agriculture

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**Abstract** — The article discusses the importance and necessity of innovative development of agricultural production, gives a theoretical assessment of innovation, identifies certain proposals for improving the innovation-oriented development of agricultural enterprises. The development of economic entities in accordance with the proposed model of innovation process management should contribute to the growth of agricultural production, the possibility of increasing the export of high-quality innovative products and the sustainability of the agricultural economy as a whole.

**Keywords** — *innovations; agricultural production; agricultural enterprises; agrarian economy; technological development.*

## I. INTRODUCTION

Currently the strengthening of Russia's position in the world markets of agricultural products, raw materials and foodstuffs seems to be the most important socio-economic and political task of the domestic agricultural economy. In recent years, a high increase in gross production for many types of food has been achieved throughout the country and its individual regions.

This allows speaking about the growth of agricultural production, which is associated with the transition to innovative technologies, the development of modern forms of organization of production and agricultural business. This in turn largely determines the increase of stability of development of agriculture and rural areas.

From this perspective, one of the factors to ensure the sustainability of the agrarian economy and the growth of its export capacity, including at the regional level, is the rationale for the development of innovative structures in agriculture.

## II. RESULTS

It is common knowledge that the innovation process is inseparably linked with the creation, development and dissemination of innovation.

Innovation can be considered in various aspects. Therefore, according to a number of scientists, innovation is the result of production activities. This result represents the original (new) or improved product, which is being implemented in the market. Innovation may be a high-tech manufacturing process.

Innovation is the basis of technological development and the result of evolutionary and interactive process of formation, use and application of knowledge in practice, which are the basis of the innovation cycle [1].

A number of other researchers made identical conclusions about the transformation of knowledge into a final product. They have identified innovation as a result, which is used in the practice of new knowledge, with the aim of modernization. In the second approach, innovations are considered as a change.

Professor Y.V. Yakovets divided the periods of innovation development into the main stages [2]:

- the beginning of the XX century – the formation of the theory of innovation;
- the middle of the 20th century – the genesis and detail of the basic innovative ideas of the previous period;
- the 70s of the XX century is a new theoretical breakthrough when there is intensive development and implementation of innovations.

J.A. Schumpeter made great influence on the development of the theory of innovation. He proposed his idea, in which he compares the economic system with a living organism, in particular, with the blood circulation in it. We are talking

about the movement of a product in the market from producer to consumer [3].

In a competitive environment, products will be successfully sold if the seller uses a new process to produce original products.

According to Professor K.L. Gavrilov, the idea from its inception to implementation in the form of a product or process goes through the main four stages [4]:

1. The development of ideas based on research and work.
2. Technical innovation based on research and development.
3. The introduction of mass production technology – technological innovation.
4. Implementation of innovation as a finished product, representing economic innovation.

According to other scientists, the result of the introduction of innovation is innovation. Therefore, it is possible to identify a number of effects that arise after the introduction of these – it is an economic, social, scientific, practical and environmental and others.

However, the synonyms of such terms as "innovation" and "innovation" are not used.

The latter concept is a kind of presentation of results of applied and fundamental research and development, or experimental work in a particular field of activity, aimed at improving their economic, technological and other efficiency. In order for an innovation to become an innovation, a positive result is required from its implementation.

Researchers mean that the processes of transformation that take place take place constantly, however, some of them can go beyond the usual framework and have a key impact on the development of phenomena, although they may not be immediately accepted by the system.

Representatives of the cyclic scientific school define innovation as some ongoing changes in the existing way of life, the order of things.

The very development of society, technology, any kind of systems and areas is based on bursts of innovative waves of various depths, durations and intensity of impact.

Researchers understood innovation as a change introducing new elements with relative stability into the area under consideration (enterprise, region, public sphere). Considering the innovation (innovation) as a certain transition from one state of the system to another, the scientist noted that both controlled and uncontrolled changes would occur in it [5].

In economic theory, there is still a dynamic approach to the definition of innovation. In this case, innovation is considered from the point of view of obtaining the result.

Researcher B. Twiss considered innovation as a process, because of which the idea itself acquired economic meaning and included various stages of scientific research, project analysis, and the dissemination of innovations.

The scientist made a number of conclusions that the creation of unique technologies and inventions is the result of applying innovative ideas in practice [6].

In modern conditions of market economy, according to the reasoned conclusions of some analysts, in the innovation process, a number of main stages can be considered, including the direct receipt of advanced (new) knowledge, the development of the latest technology and, as a result, the creation of the latest product, product that is characterized by higher quality and competitiveness [6].

Considering the opinion of R.A. Fatkhutdinova, who defined innovation as a process, including its planning, development, practical application and diffusion of innovations, we can conclude that the author as a process, the results of which are their implementation and use, presents the "innovations" [1].

Therefore, in the interpretation of the category in question, the researcher lays down the stages that are not related only to innovations, and, most likely, describes from them those that are inherent in the process.

Innovation activity is considered as a combination of complex and heterogeneous phenomena and processes (financial, organizational, commercial, etc.) leading to the implementation of innovations and innovations.

Based on the foregoing, the conclusion suggests itself that the term innovation and innovative activity are identical, synonyms, which contradicts logic.

In fact, innovation, as an economic category, should be considered as the result of scientific, technological organizational, financial actions, demanded by the consumer, materialized in the form of a new or significantly modernized product (service) in order to obtain economic, social, environmental and other types of effect.

Thus, the success and efficiency of the functioning of economic sectors directly correlates with the ability of state authorities to analyze predict and promote the development of the innovative component of socio-economic systems. At the same time, innovative process management models play a key role in the perception and evaluation of innovative activity.

Returning to agriculture, the important role of a rationalistic management concept should be noted. It provides for the use of a linear model of the innovation process, based mainly on the influence of internal factors that ensure the sustainable development of agricultural organizations. At the same time, the evolutionist approach to the management of innovative processes in agriculture focuses not only on the production and on resource potential of the organization, but also its competitiveness and environment, taking into account the socio-economic situation of the region, which implies an analysis of the market conditions for innovative agricultural products [7].

However, in modern conditions of management, the described management models do not largely take into account the probabilistic nature of the innovation process-taking place in agricultural production. This is reflected in the formation of a combined non-linear model of managing innovative

processes, combining the scientific potential of the agricultural sector, the level of technical and technological equipment of agricultural organizations and the real need of agricultural production for innovation. Later, this management model was transformed into a chain model of the innovation process, which was associated with the strengthening of the competitive environment and the increasing role of the development of human resources in agriculture.

The development of intra-organizational and inter-farm relations during the implementation of innovative processes in agricultural production has led to increased integration between suppliers of innovative products and its consumers using a network model for managing innovative processes.

The important feature of this model is the establishment of more effective communication links between all parties interested in technical and technological changes in the agricultural sector.

The innovation process management model based on open innovation includes three components:

- a process that affects the external environment of an organization;
- process that affects the internal environment of the organization
- interconnected process of exposure.

However, the demand for innovative products does not fully reflect the real pace of development of the innovation process in agriculture. The modern model of innovation process management based on open innovation involves the creation, development and dissemination of innovation, not only based on an analysis of the internal needs of a particular agricultural organization, but also taking into account the general development trends of the agricultural sector.

The above-described models of managing innovative processes in agriculture, in our opinion, do not sufficiently ensure the necessary level of development of agricultural production, since they practically do not take into account the degree of involvement of agricultural organizations in innovative activities carried out in agricultural production. Studies have shown that a distinctive feature of innovation in agriculture is that the process of diffusion of innovations occurs gradually and is ensured under the condition of the interaction of certain factors of the internal and external environment of the agricultural organization, taking into account the coordination of scientific research at all stages of the innovation process:

- human resources and educational and research support;
- production and technological support;
- information and consulting support;
- ensuring the supply and marketing of agricultural products;
- financial security [8].

In addition, in this case, a high-tech product can be considered an innovation in the case of its first commercial use

in a single agricultural organization. Based on this, it is possible to substantiate the model of management of innovative processes in agriculture.

The advantage of this model is the multiplicative ability, which is expressed not only in obtaining and accumulating the necessary information about the state of innovative processes from the external environment, but also in the impact of the agricultural organization itself on its external environment.

It is assumed that the proposed management model should be characterized by the ability to adapt the agricultural organization to the changing conditions of the internal and external environment. As well as the ability to make flexible managerial decisions at all stages of the innovation process, taking into account a sufficiently high level of risk situations when using innovations in agriculture.

However, the rather low susceptibility of rural producers to existing and emerging on the market high-tech products indicates the need for multi-criteria analysis and evaluation of the effectiveness of the introduction and development of innovations in agricultural production.

The methodology for assessing the innovative activity of agricultural organizations is based on the use of several blocks of indicators characterizing the level of innovative activity. It includes production and marketing, socio-economic and financial-investment indicators.

Conducting research using the proposed model allows the "typification" of agricultural organizations in a certain region according to the level of innovation activity and the degree of involvement in the innovation process.

Four groups can be distinguished according to the severity of the type with different values of their integral ranges.

#### 1. Actively oriented:

- engage in innovative activities;
- use the most effective production technologies;
- there is a complete innovation process from research to the implementation and commercialization of innovations.

#### 2. Passively oriented:

- engage in innovative activities;
- master innovations after initial testing in agricultural organizations of the first type and are their "followers";
- Not a complete innovation process takes place, but only the commercialization of innovations.

#### 3. Potentially oriented:

- do not engage in innovative activities;
- use widespread technologies;
- in the presence of certain resources, organizations are ready for the implementation and commercialization of innovations.

#### 4. Conservatively oriented:

- do not engage in innovative activities;
- use less efficient technologies;
- in the presence of certain resources, organizations are not ready for the implementation and commercialization of innovative solutions.

Such “typification” of agricultural producers, on the one hand, characterizes enterprises by the level of technological support for production, and on the other hand, it forms indicators for managing agricultural innovation and allows:

- assess the level of innovative activity of enterprises;
- to analyze the economic efficiency of production in enterprises with different levels of innovative activity;
- offer a further direction of their innovative development.

From our positions, the level of innovative development of enterprises, organizations, regions and other business entities is determined by many factors: economic, industrial, social, environmental, institutional (organizational), which themselves can change under the influence of external and internal functioning environment.

The degree to which business entities use their own funds is of particular importance for agricultural production, the result of which is the receipt of additional income that affects the change in profit. The best use of production and resource potential and the ability to effectively use all types of financial investments, in particular, investments, as well as various kinds of subsidies received from budgets of all levels.

Since the interdependence and mutual influence of these factors on each other is not a constant and balanced process, at each stage of the development of innovative structures of functioning agricultural organizations, some shifts of interaction points can occur, which, of course, will affect the final result.

It can be conditionally established when the level of innovative activity is reached, which is at least half of the forecast for each criterion characterizing the degree of involvement of the business entity in the innovation process. That is, the use by an economic entity of more than 50 % of its

capabilities, taken together, a result will be obtained that determines a sufficient level of innovative activity of economic entities.

### III. CONCLUSION

The significance of the research lies in the fact that the application of the proposed model of management of innovative processes in agriculture allows determining the regional and economic units of the region. Namely they are specific business entities that have a high level of production with a high degree of efficient use of available resources, and use financial and investment resources quite effectively for their development. At the same time, measures should be justified for agricultural producers with a lower level of innovation activity that promote better use of available resources, a possible structural change in production, and targeted financing.

Thus, the development of economic entities in accordance with the proposed model of innovation process management should contribute to the growth of agricultural production, the possibility of increasing the export of high-quality innovative products and the sustainability of the agricultural economy as a whole.

### References

- [1] N. Zhdankin, *Innovation management*, Textbook. Moscow: KNORUS, 2017.
- [2] Y. Yakovets, *Global Economic Transformations of the 21st Century*. Moscow: ZAO: Publ. house Econ., 2011, pp. 18–47.
- [3] E. Zolotonog, *Development of the theory of innovation in the works of Joseph Chumpeter*. Krasnodar: Publ. House of the Univer., 2017, pp. 165–170.
- [4] A. Solovyeva, *Essence of innovation in economic theory and practice*. Tyumen: TIU, 2017, pp. 243–246.
- [5] I. Travnikov, *Theory of innovation: formation and development*. Kazan, 2017, pp. 63–65.
- [6] B. Twiss, *Management of scientific and technological innovations*. Moscow: Econ., 1989, pp. 33–36.
- [7] S. Neumin, “The socio-economic framework of the region: calculation and analysis”, *Biotika*, vol. 6, Big Vyazemy, pp. 226–231, 2015.
- [8] G. Chesbrough, *Open Innovation. Creating Profitable Technologies*. Moscow: Generat., 2007.