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METHODOLOGY FOR SELECTING INNOVATIVE INVESTMENT PROJECTS FOR MODERNIZATION OF PLANT GROWING

Abstract. *This article discusses the methodological features of assessing the effectiveness of investments, the development of technical and technological innovations in plant growing, the economic principles of forming and developing the technical and technological base of plant growing. Also, an assessment and analysis of the economic effectiveness of investments in the implementation of a differentiated fertilizer application system by agricultural enterprises are presented.*

Keywords: *investment, efficiency, plants, agriculture, principles, technical and technological.*

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МЕТОДОЛОГИЯ ОТБОРА ИННОВАЦИОННЫХ ИНВЕСТИЦИОННЫХ ПРОЕКТОВ ДЛЯ МОДЕРНИЗАЦИИ РАСТЕНИЕВОДСТВА

Аннотация. *В данной статье рассматриваются методические особенности оценки эффективности инвестиций, разработки технических и технологических инноваций в селекции растений, экономические принципы формирования и развития технико-технологической базы селекции растений. Также представлена оценка и анализ экономической*

эффективности инвестиций сельскохозяйственных предприятий во внедрение системы дифференцированного внесения удобрений.

Ключевые слова: *инвестиции, производительность, заводы, сельское хозяйство, принципы, технико-технологические.*

Introduction. Successful solution of the tasks of ensuring food security of the country, formation and increase of its export potential for entering the world markets of agricultural raw materials and processed products requires increase in the volume of agricultural production in a short time, improvement of its quality, reduction of production costs, which determine the cost price and competitiveness of products in the domestic and foreign markets.

Crop production is the basic branch of agriculture, on the sustainable functioning and development of which the efficiency of the entire agricultural production depends to a decisive extent. In turn, the efficiency of crop production is largely determined by the state of its material and technical base, the basis of which is the machine and tractor fleet of agricultural organizations and the agricultural technologies for cultivating agricultural crops implemented with its help. The market transformation of the domestic agricultural economy in the 90s of the last century and the beginning of the 2000s was accompanied by a number of negative processes, the main ones being a sharp weakening of state support for commodity producers, high prices and low availability of borrowed capital, fragmentation of large collective forms of management and the formation of numerous small peasant (farmer) households on their basis that do not always function effectively, low financing of domestic agricultural science and insufficient support for agricultural machinery, food and processing industry enterprises. All of the above disrupted the reproduction processes in the country's agriculture, led to the weakening and destruction of its material and technical base, and held back the introduction of modern achievements of scientific and technical progress in agricultural production. The fastest possible restoration of the material and

technical base of the main branch of agriculture - crop production and its effective innovative development require significant capital investments. Therefore, research aimed at substantiating priority areas for innovative development of the technical and technological base of plant growing is timely and relevant.

Literature analysis. The economic aspects of the formation, organization of effective functioning, reproduction and development of the material and technical base of plant growing are the subject of the works of domestic agricultural economists A. I. Altukhov, V. P. Alferyev, V. M. Bautin, V. T. Vodyannikov, V. I. Dragaytsev, Yu. A. Konkin, A. P. Kurnosov, A. A. Polukhin, I. S. Sandu, K. S. Ternovykh, A. V. Tolmachev, I. G. Ushachev, I. F. Khitskov and others. The issues of reproduction of fixed assets of agricultural producers are considered in the works of V. V. Garkavy, A. V. Gladilin, G. K. Kosachev, V. V. Kuznetsov, I. A. Minakov and other authors. The economic aspects of the formation and organization of the effective use of the machinery and tractor fleet of agricultural enterprises are described in the studies of Yu. I. Bershitsky, L. S. Orsik, P. F. Paramonov, A. I. Trubilin, K. E. Tyupakov, A. V. Ulezko, A. V. Shpilko and other scientists.

A fundamental contribution to the development of the methodology for assessing the effectiveness of investments in real assets of enterprises was made by the works of D. Bailey, G. Birman, T. S. Khachaturov and other authors.

The listed works constitute the theoretical and methodological basis of the problem under consideration. At the same time, they do not sufficiently disclose, and therefore require clarification, deepening and development, such important components as determining the place and role of modern mechanized technologies in the system of crop production, developing methodological approaches to the economic justification of priority areas of innovative development of the technical and technological base of the industry, adapting existing methods for assessing the effectiveness of investments to the specifics of the innovative transformation of the applied agricultural technologies and the technical means implementing them.

The above determined the choice of the topic of this dissertation, and also allowed us to formulate the goal and objectives of this research.

Analyzes and main results. The implementation of technical and technological modernization of the plant growing industry is possible only with the implementation of an innovation-oriented model of development of the entire agriculture and individual economic entities. The limited volume of investment resources that can be directed to the implementation of technical and technological innovations, objectively determines the need to increase the reliability of the assessment of the effectiveness and riskiness of investments in the implementation of specific innovative solutions.

The methodological approach to the selection of innovative investment projects for technical and technological modernization of the plant growing industry proposed in the work is based on the following provisions:

- each innovative investment project should be considered in the context of the general paradigm of the development of the agro-economic system, taking into account the impact on its organizational and economic, technical and technological, social and environmental characteristics and the possibility of realizing the development potential;

- when selecting innovation and investment projects, priority should be given to integrated solutions that provide organizational and technical capabilities for the implementation of new technological solutions that allow for sustainable competitive advantages by minimizing the cost of production and increasing its production volumes;

- the selection of innovation and investment projects should be carried out on the basis of an assessment of the effectiveness of alternative projects, taking into account ensuring optimal utilization of universal and specialized agricultural machinery, and minimizing the costs of its maintenance and maintaining operability, as well as the asynchrony of investment costs;

- the costs of implementing specific innovation and investment projects should take into account the costs of forming an adequate system of infrastructure support necessary to maintain the operability of a set of technical means and implement the selected technological process;

- the assessment of the effectiveness of each innovation and investment project should take into account the complex influence of the entire set of factors that shape the environment for the functioning of agro-economic systems (natural, institutional, macroeconomic, organizational, social, technical, technological, etc.);

- the composition of the machinery and tractor fleet of an economic entity should be formed taking into account the totality of all implemented innovation and investment projects based on the total size of land use and the average size of working plots, the prospective structure of crop areas and the optimal timing of optimal technological operations;

- the long term of implementation of innovation and investment projects in crop production requires the introduction of an additional block describing the process of reproduction of the material and technical base of the industry and determining the level of investment and operating costs to ensure the reproduction process;

- forecasting of cash flows for each innovative investment project should be carried out based on the cash flows of projects already being implemented or planned for implementation, taking into account the total financial obligations of economic entities and their participation in state support programs; assessment of the effectiveness of each innovative investment project should take into account the level of general and specific (natural and climatic, production and technological, socio-demographic, marketing, financial, administrative, political, etc.) risks.

Innovative renewal of the technical and technological base of plant growing should be carried out taking into account the individual characteristics of specific commodity producers, determining the choice of mechanized innovative

agricultural technologies and the complexes of technical means required for their implementation. The program of innovative transformation should be developed on the basis of a technical and economic analysis of the current system of managing the plant growing industry, including diagnostics and assessment of the applied agricultural technologies of cultivated agricultural crops, as a result of which the most resource-intensive field operations subject to priority improvement will be identified.

In the course of the study, it was established that the introduction of innovative technologies in plant growing is impossible without the restoration and development of the domestic agricultural engineering industry. At the same time, the author identified systemic problems in the agricultural engineering industry, the main ones being: high interest rates on bank loans, rising production costs in the industry due to the outstripping increase in prices for raw materials and energy resources, low investment in upgrading fixed assets, lack of sufficient and stable demand in the domestic market, etc.

Conclusions and suggestions. Currently, the innovation market for the agricultural sector offers a wide range of technological solutions that provide both a comprehensive solution to the problem of increasing the growth of efficiency in the crop production sector as a whole and individual elements of production processes designed for agricultural producers with different levels of financial capabilities and technical and technological development. Most business entities in the agricultural sector define the transition to the mass use of "precision" farming technologies as a priority direction for modernizing the technical and technological basis of crop production. At the same time, the implementation of the strategy for the transition to a new level of crop production is possible only under the condition of comprehensive digitalization of agro-economic systems. Large integrated agro-industrial formations have begun to widely implement land sensing technologies, form systems of geoinformation support and global positioning of units, allowing to create conditions for the effective use of parallel driving technologies,

differentiated application of mineral fertilizers and chemical plant protection products, etc. But for economic entities that are not ready to implement such a strategy for the development of the crop production sector and have limited investment opportunities, technical and technological solutions that allow to increase the competitiveness of crop products by minimizing operating costs (in the cost structure, depending on the type of product, their share reaches from 40% to 70%) and increasing the use of the potential of productive lands are becoming especially relevant.

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