



INNOVATION EFFICIENCY IN THE GRAIN SECTOR

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ABSTRACT

This thesis scientifically examines the issues of improving production efficiency in the grain sector through the implementation of innovative technologies. The study analyzes the advanced experience of foreign countries in technical modernization and innovative development and substantiates the possibilities of adapting these practices to local conditions. In addition, the role of assessing the level of innovative technology adoption, digital solutions, technical modernization, and agro-consulting services in the grain sector is revealed. The research findings provide a basis for developing scientific and practical recommendations aimed at increasing production efficiency in grain farming, ensuring rational use of resources, and effectively applying market mechanisms.

Introduction. At present, the rapid growth of the world's population, the intensification of global climate change, and the increasing challenges of ensuring food security necessitate the innovative development of agriculture, particularly the grain production sector. Grain products occupy a key position in the consumer food basket, and their stable and efficient production constitutes an essential component of national economic security.

The experience of developed countries demonstrates that improving grain production efficiency largely depends on the integration of innovative technologies, technical modernization, digital solutions, and agri-consulting services. Such an approach contributes to reducing production costs, increasing the efficiency of machinery and technology utilization, and mitigating market-related risks.

From this perspective, this thesis analyzes the prospects for enhancing innovation-driven grain production efficiency and, based on international experience, formulates scientifically and practically grounded conclusions and recommendations.

Analysis and Results

The study and adaptation of advanced international practices in agricultural technical modernization play a crucial role in increasing the efficiency of innovation-based grain production under local conditions. In particular, the practices of Germany, the United Kingdom, Canada, the United States, and Japan show that technical modernization is not limited to the purchase of new tractors or combine harvesters, but is implemented through an integrated "full-service ecosystem", which includes after-sales services, spare parts supply,

continuous consulting, warranty support, routine and capital repairs, as well as training of machine operators and engineering personnel. This approach ensures uninterrupted operation of agricultural machinery and enhances resource-use efficiency in grain production.

International experience also highlights the well-developed dealer network as one of the key institutional factors accelerating technical modernization. Dealer centers not only meet farmers' demand for modern equipment but also provide machinery sales and leasing, spare parts supply, rapid maintenance and repair services, technical operation consulting, and professional training for machine operators within a unified service package. As a result, organizational and technological risks associated with the introduction of innovative technologies are reduced, losses caused by equipment failures are minimized, and stable grain yields are supported. In the practices of the United States and European countries, contractual economic and legal relations between manufacturing companies and dealers are clearly regulated. Service obligations are not limited to the warranty period but may be extended through separate contracts for subsequent periods. The advantage of this system lies in the fact that machinery purchasers are informed in advance about the continuity of spare parts supply, rapid service, warranty repairs, and technical inspections. As a result, grain production processes can be reliably planned, the operational efficiency of the machinery fleet increases, and opportunities for optimizing production costs are expanded.

Conclusion

The conducted research has scientifically substantiated that the introduction of innovative technologies in the grain production sector is one of the key factors in improving production efficiency. Analysis of international experience demonstrates that an innovation-oriented approach integrating technical modernization, digital technologies, and service support contributes to rational resource use, increased productivity, and reduced market risks in grain production.

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