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1.2 Optimization of accounting and operational control of agroinnovations in the enterprise management system

Agricultural enterprises should be interested in combining their interests and efforts in the creation and application of new technologies in order to enter the domestic and foreign markets with competitive products.

At present, most enterprises in the agricultural sector are clearly aware of the importance and regularity of expanding production and increasing profitability through the introduction of agroinnovation. In this situation, the decisive place belongs to the state support of the strategy of innovative development of agroindustrial enterprises, which should be carried out on a systematic and consistent basis.

The current state of the agricultural sector is due to the global impact of technological modernization, which is not always appropriate and does not meet the real needs and capabilities of agricultural producers. Agrarian enterprises, striving to adhere to the basic principles of innovative development must take into account the features and capabilities of the domestic agricultural market and the need for environmental safety.

The analysis of the current formal norms in the field of agricultural relations shows that both conceptually and in terms of applied nature, institutional regulation of innovation is carried out in the absence of a unified system approach, clear methodology and comprehensive assessment of transformations.

Most of the enterprises of agroindustrial complex do not single out such an object of management accounting as innovation costs, there is no established system of operational control.

Foreign scientists P. Drucker, B. Santo, and others made a significant contribution to the development of world scientific thought regarding the theory of innovations.

At the same time, there are different approaches to defining the economic essence of the term "agroinnovation" and the effectiveness of innovation by agricultural enterprises.

Features of accounting in the management of innovation are reflected in the scientific achievements of Andrushko R., Didukh D., Zhuk V., and others.

Based on a large number of scientific interpretations of the category «agroinnovation» there is a need to study the organizational principles of accounting and methods of control over the formation of costs for innovation of agricultural enterprises.

In Law and Ukraine «On innovation activity», noted that innovation - a newly formed (applied) and (or) improved competitive technologies, products or services as well as organizational and technological solutions of industrial, administrative, commercial or otherwise, which significantly improves structure and quality of production and (or) social spheres [11].

Innovative activity is an activity aimed at finding opportunities to intensify agricultural production and meet social needs in competitive products and services through the use of scientific, technical and intellectual potential [12].

Innovations in agriculture are the implementation in economic practice of the results of scientific research, which are embodied in new plant varieties, breeds and species of animals, new or improved food, materials, new technologies in animal husbandry, crop and processing industries, new methods of prevention and treatment of animals and birds, new fertilizers and pesticides in crop and livestock production, new forms of organization and management, new approaches to the provision of social services, which can increase production efficiency. Agroinnovation is an asset of economic activity of agricultural enterprises and a separate object of accounting. Agroinnovative products are the costs of the enterprise to create, improve or acquire assets (products) that are innovations.

Agroinnovation processes cover all aspects of activity (operational, financial and investment) and represent the costs of implementing measures to implement innovations [13]. A distinctive feature of agroinnovation is the presence of a separate

group of innovations related to the presence of biological elements in the agro-production system, which should include not only crops and animals, but also agricultural land.

For accounting purposes, «innovation» - new advances in industry, technology or management, intended for use in operating activities of the enterprise [14].

According to current national standards, the definition of accounting objects «agricultural innovation» and «agroinnovation» does not exist. In addition, these objects are not reflected in the relevant indicators in the financial statements.

Thus, in a narrower sense, agroinnovation is the implementation in economic practice of research and development in the form of new technologies, new approaches to management, marketing, logistics, which increase production efficiency and product competitiveness.

Based on the study of foreign and domestic research, it should be noted that among the main differences highlighted by the authors between the types of innovations include the insignificance and secondary nature of certain classification features and the lack of clear boundaries [15].

The classification of innovations according to the degree of novelty is to divide the set of innovations into homogeneous groups according to the comparative level of novelty in order to assess their significance. The concept of novelty of innovation can refer to a product or technological process or only to some of its elements.

Thus,with the nature of the needs that are met, innovations can be focused on existing needs or can create new ones. With a degree of novelty, innovations can be based on new discoveries or be created on the basis of a new method applied to existing phenomena [16].

To carry out innovative activity, we offer agricultural enterprises the following classification features and groups of a*g*roinnovations in table 1.

Table 1.

Classification features and groups of agroinnovation

Classification feature	Classification group
The degree of novelty of innovations	• New for the company • New for the region • New to the region • New to the industry
Degree of effectiveness	• Basic • Improving • Secondary • Pseudo-innovations
Subject and sphere application of innovations	• Biological • Economic • Technical • Technological • Social • Management • Marketing • Environmental
Influence on the production process	• Innovations that require large investments • Innovations that require minimal costs • Innovation is possible at no extra cost
According to the direction of impact in elychyn in costs	• expanding • variables • rationalizing
Degree of specialization innovation	• Highly specialized • Special • Universal
"Purity" of innovation	• Patent • License • Offer • Royalty
Degree of risk nature needs met	• Absence • Complete uncertainty • Uncertainties • Focused on existing needs • Can create new ones
Sales volume innovation project	• Internal market • Foreign market
The object of innovation	• Resource • Process • Market
Direction of use	Profitable • Non-profit

Source: generated by the author.

According to the direction of the impact on the cost of innovation are divided into: expanding, streamlining and variable. Expanding agroinnovation aims to penetrate deeper into various industries and markets of existing basic innovations (for example, computerization from the limited use of large computers to the widespread use of personal computers and the Internet). Rationalizers are significantly close to

improving. Variable innovations are designed to replace some products or technologies with others (new ones) based on the performance of the same functions.

The complex nature of agroinnovations, their complex nature, variety of areas and methods of use determines the allocation of clear criteria for their classification in agro-industrial production. This will allow a more complete and objective assessment of them and determine the effectiveness and focus, as well as determine the management methods for each of the groups.

A distinctive feature of agroinnovation is the presence of a separate group of innovations related to the presence of biological elements in the agro-production system, which should include not only crops and animals, but also agricultural land. The most important means of production and a special object of innovation - is made of earth.

To build an effective system of accounting for agroinnovation costs, enterprises should take into account and determine the following factors in Fig.1.

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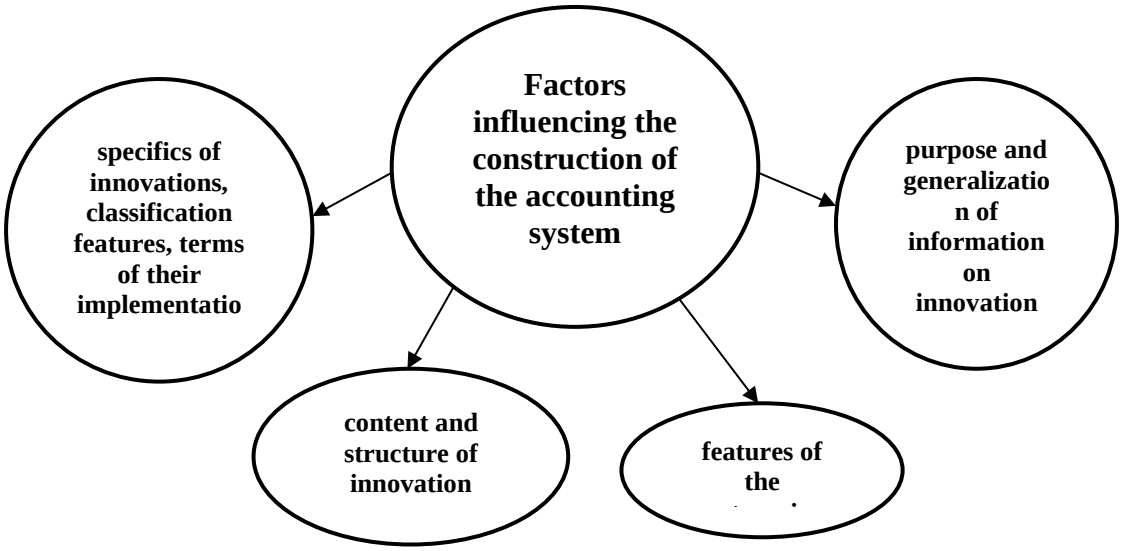

Figure 1. The main factors that determine the accounting system of agroinnovation.

Source: generated by the author.

The accounting system built in this way will allow to obtain complete and reliable information on innovation costs in various aspects and use it for planning, management, analysis and control.

Agroinnovation is an asset of economic activity of agricultural enterprises and a separate object of accounting.

Agroinnovative products are the costs of the enterprise to create, improve or acquire assets (products) that are innovations. Agroinnovation processes cover all aspects of activity (operational, financial and investment) and represent the costs of implementing measures to implement innovations.

For the purposes of accounting, the system of classification features of agroinnovative activity is of decisive importance:

- by types of objects;
- ways of creating;
- terms of project implementation (Fig. 2).

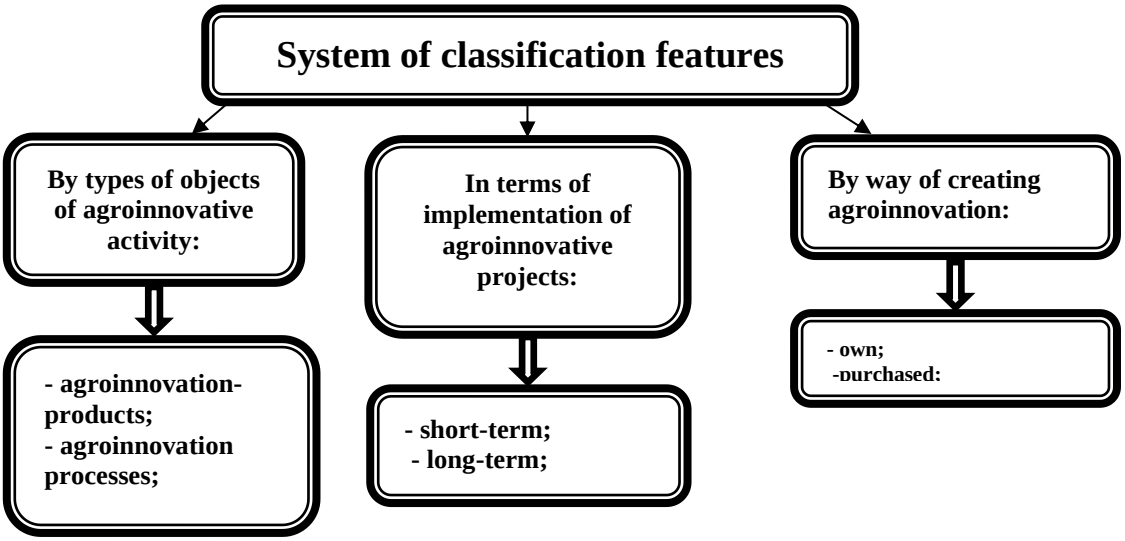

Figure 2. The system of classification features of agroinnovative activity.

Source: generated by the author.

We will consider the developed classification of agroinnovations in the context of accounting objects in table 2.

Table 2.

Classification of agroinnovation in terms of accounting objects

Accounting objects	**Definition**
management	reorganization of the management structure
freight	introduction of a new product, or qualitative changes of the old one
technological	introduction of new technologies, production methods
logistics	development of new methods of formation of movements and sources of supply of raw materials
market	associated with the development of new markets for existing or innovative products, goods and services
marketing	development of new methods of product promotion on the market, new ways of market monitoring
and information - analytical	reforming or transforming accounting and analytical and control systems
social	introduction of new social programs for employees of agricultural enterprises
ecological	implementation of new measures to ensure environmental protection
cultural and ethical	formation of new thinking in employees regarding life-oriented values

Source: generated by the author.

The classification given proves that it is expedient to apply the uniform cost measuring instrument for its estimation in full reflection.

At the same time, there is a need for information about innovative projects in order to manage the production and economic activities of agricultural enterprises.

In the context of the system of accounting, agroinnovation is a a set of economic operations that have a quantitative-conditional expression and form a single process: development (expansion) - expansion - implementation - operation of innovations and reflected in the registers of management accounting and financial reporting, as the assets of enterprises and the source of its formation.

The accounting system built in this way will allow to obtain complete and reliable information on innovation costs in various aspects and use it for planning, management, analysis and control.

The introduction of the latest developments in the control and accounting process is the key to sustainable development of agriculture. development in this area based on the use of information technologies including geographic information systems, which are used for collecting, storing, processing and distribution of spatial data to make informed management decisions [17].

At the local level, a large number of geographic information systems are offered, which are adapted for management decisions and accounting systems in agriculture, in particular: MapInfo, Atlas GIS, ArcView and others. Arc GIS and ArcView with special operational accounting modules, 3D image output, and spatial analysis have become the most widespread in the domestic market. Arc GIS and Mapinfo Professional geographic information systems with a wide range of tools for creating electronic maps.

The use of geographic information systems in the accounting of agricultural enterprises has made it possible to introduce innovative methods of agriculture. One such technology is «Precision Farming», which became widespread in European countries in the 90s of last century and is recognized by world agricultural science as an effective way to save resources and reduce the negative environmental impact of production. Technologies of precision farming are based on the analysis of each field: determination of features of a relief, agrochemical structure of a soil cover and application on each site of a field of various agrotechnologies. Based on the biological needs of plants, a normalized dose of mineral fertilizers is applied only in those areas that require it. All this provides significant savings in mineral fertilizers and reduces the likelihood of environmental pollution.

The positive effect of the introduction of these innovative accounting technologies is achieved by using multifunctional integrated systems that contain a variety of materials and data: digital topographic maps of agricultural land, soil information, digital terrain models, meteorological observations, statistics and more.

However, the efficiency of these systems is directly proportional to the scale of enterprises and the volume of agricultural production.

Automation of accounting at the lower level can be done by GPS-navigation methods, which requires a much smaller amount of investment, but accordingly provides a smaller range of information support for decision-making. The collection of information for the operation of such systems is carried out using hardware monitoring, which provide reception of GPS signals, collection of measurements from installed sensors and transmission of indicators to the database server.

As a result of the use of GPS-technologies, a certain set of indicators is transferred to the accounting system, which allows to perform all necessary operational management functions, such as planning of technological operations, control over equipment, resource use, compliance with technology, operational analysis and more.

Modern software that serves GPS- navigators, in real time gives the accounting specialist a set of indicators: location of equipment, speed and direction of its movement, distance traveled (cultivated area), fuel consumption and residue at a particular object of observation, creates conditions for control of primary documents on production of agricultural products.

This allows you to remotely control and regulate the operation of a single unit of equipment, analyze the efficiency of technological operations, eliminate the additions of mechanics, helps to save fuel.

Agroinnovation is a specific object of management accounting and requires operational control in the agricultural enterprise [18].

A weak link in the formation of effective innovative development of agricultural enterprises is the study of demand for agroinnovation.

Marketing should become an integral part of the formation of orders for research and development. And when selecting agroinnovative projects to conduct a deep economic examination. Evaluate efficiency indicators and work out schemes for promoting the obtained results in production.

The figure 4 shows the main tasks and objects of operational control of agroinnovative activities of enterprises.

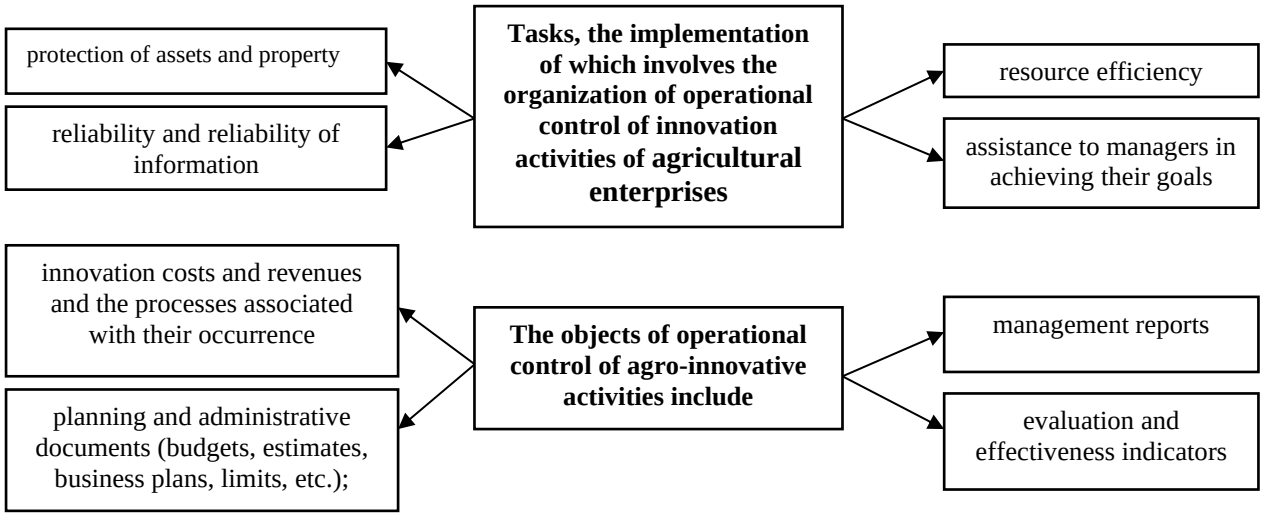

Figure 4. The main tasks and objects of operational control of agroinnovative activities of enterprises

Source: generated by the author.

Agroinnovative activity is an important component of the system of measures to accelerate the development of agricultural enterprises, increase their efficiency and competitiveness of products.

As a rule, in-depth economic expertise is not conducted during project selection, efficiency indicators and risks and schemes of promotion of the obtained results into production are not evaluated. This leads to the fact that many innovative developments do not become an innovative product.

For accounting purposes, the decisive factor is the division of agroinnovation by types of objects of innovation, methods of creation and timing of projects, which will increase the analytical information.

Solving the above problems will contribute to a significant increase in innovation activity, create a comprehensive accounting and analytical system and increase the effectiveness of control.

All participants in the innovation process should be interested in combining interests in the application of new technologies in order to enter the domestic and foreign markets with high-tech products.