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DIGITALIZATION OF THE AGRO-INDUSTRIAL COMPLEX

BT Mukhamadiev, docent, Bukhara Engineering-Technological Institute
ZB Mukhamadieva, Senior Lecturer, Bukhara Engineering-Technological Institute
muhamadievazarina718@gmail.com
Bukhara, Uzbekistan

Abstract: Reducing the volume of manual labor, increasing the efficiency of production and business processes is the main goal pursued by automation of agricultural industries. Statistical figures prove the insolvency of agricultural enterprises with a high proportion of mechanization. The level of losses at different stages of production can exceed 50%. This is especially noticeable in dairy cattle breeding, grain production, tubers and fruits and vegetables.

Keywords: digitalization, product quality, automation of agro-industrial complex, navigation systems, software.

Introduction

Losses occur during prolonged storage, crop processing, and during the preparation of planting material. Digitalization is aimed at reducing product losses and reducing production costs.

The advantages of digitalization include:

• the ability to optimize production, establish technological cycles and business operations, and manage them effortlessly;

• increasing the productivity of an agro-enterprise by reducing cost, improving product quality, and ensuring competitiveness growth;

• reduction of production costs leads to a drop in the cost of products;

• the possibility of realization at a favorable cost for the buyer and the manufacturer [1,2].

A 1C-based software solution for agricultural automation is selected depending on the scale of production and the main field of activity of the enterprise. Digital systems and devices partially or completely free you from solving problems in the field of control and management of the production cycle. Experts identify agricultural enterprises among the main consumers of information technology in the coming years.

Methodology

Digitalization of the processes of growing crops is a new promising direction in the agro—industrial complex. Each industry has its own characteristics in the field of control and production processes and the practical implementation of tasks. For the effective cultivation of plants, control systems for agricultural machinery and the production cycle are used at all stages.

To successfully complete the tasks set in the agro-industrial complex, the following monitoring methods are used using appropriate equipment and technologies:

• analysis of the vegetative index at all stages; cultivation of crops;

• control of the amount and cycle of fertilizer application;

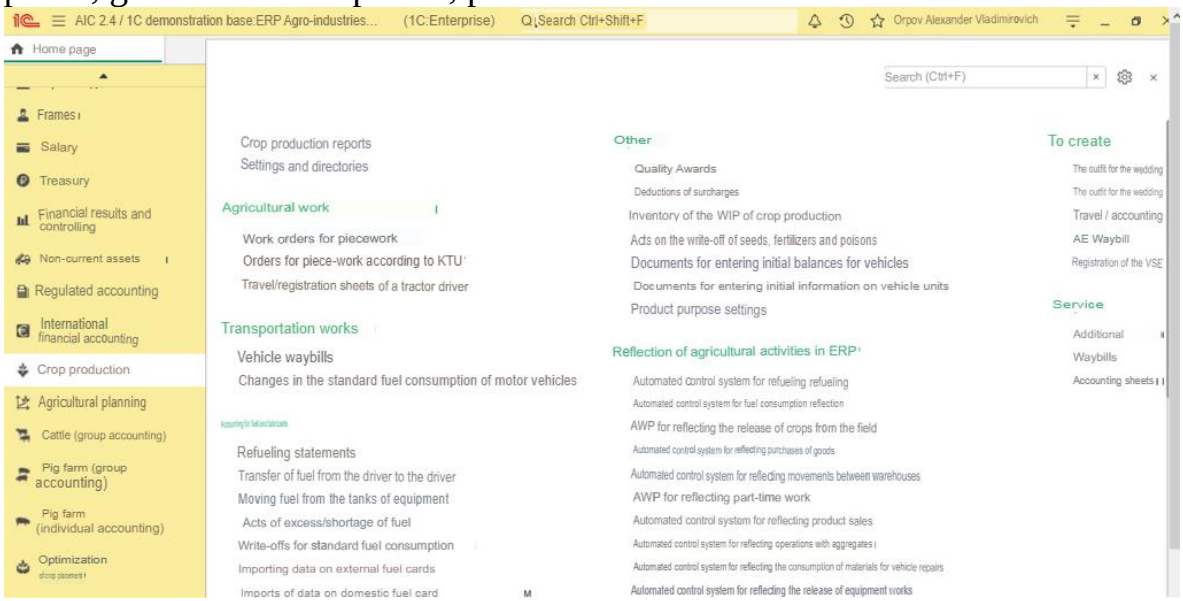
• Soil sample analysis;

• control of humidity and temperature of air and soil;
• forecasts for the future harvest;
• setting up automatic sowing and watering systems;
• Parallel driving and recognition systems for sowing and harvesting.

Digitalization technologies for growing plants and methods for exchanging the obtained data allow farms to make the right decisions on the timing of planting and harvesting. Determine which areas need more frequent watering, which plantings should be given special attention, and which do not require large time and material costs [3].

GPS navigation systems in crop production help to control sowing and harvesting equipment. Detailed yield maps cannot be done without them. The system allows you to control crop rotation and makes it possible to grow different crops in the same field.

The software package is suitable for automation of greenhouses, crop production enterprises, greenhouse complexes, plant nurseries.



The page in the 1C program: ERP Agro-industrial complex

Advanced information technologies will also be of interest to agricultural organizations, farmers and entrepreneurs whose activities are related to the production of seedlings, the cultivation of cut greens, seedlings and potted plants. Automation will allow you to properly organize the wholesale and retail sale, storage, packaging and labeling of crop products [4].

Results

Automation affects not only the production process. It solves issues of productivity improvement, minimizes the number of errors related to the human factor, and reduces the amount of manual labor. Several 1C-based programs are used for automation in agricultural enterprises.

The program is designed for automation of large and medium-sized agro-industrial enterprises. It is recommended for installation on farms engaged in crop production. It is also suitable for pig farms and dairy farming.

The solution supports the entire production chain from planning to calculating the actual cost of production. The software allows you to avoid errors in the overall production cycle and at all its main stages separately.

The implementation of the software product allows you to solve the following tasks:

- manage production, procurement, and inventory control;
- keep records of sales, cost of production, expenses;
- calculate employee salaries and manage staff;
- organize the schedule of maintenance and repair of equipment;
- control any financial transactions, plan the budget;
- to check and analyze the results of the work of the agricultural enterprise;
- send reports over the network between departments;
- optimize the location of crops in fields and warehouse products;
- take into account the deadlines for the work;
- monitor transport at the enterprise and track fuel consumption;
- Manage relationships with suppliers and wholesale customers [5,6].

1C:ERP has a special control panel for the management of an agricultural organization, which reflects the main indicators for the industry.

Modular solutions for quantitative and qualitative accounting of grain in crop production processes.

Discussions

This software product is designed to automate the accounting of the quantity and quality of grain, its processed products, and feed production. The program is suitable for installation in elevators, storage warehouses, feed mills, processing plants with secondary feed production.

It allows you to organize a single information space for effective interaction of the following enterprise services:

- sighting post, automobile and railway weighing complexes, grain laboratory;
- elevator (unloading and loading control), open storage warehouses;
- accounting for raw materials;
- feed mill (packing, shipment of finished products);
- laboratory of finished product quality;
- commercial department and legal service of the company;
- logistics service [7].

The product is developed in accordance with the current industry requirements for the methodology and document management of quantitative and qualitative accounting of grain and its processed products and provides automation of the following business processes:

- contractual work with depositors and suppliers;
- acceptance of grain from motor transport and railway transport;
- drying, cleaning of grain;
- grain processing;
- formulation and production of compound feeds;
- transfer of raw materials for processing;
- accounting of production output;

• re-registration, shipment of grain and products;
• internal movement of grain and products to storage locations;
• warehouse accounting of grain and products;
• quantitative and qualitative accounting of grain and products in the laboratory and the operational department of accounting, cleaning of batches;
• accounting and analysis of services rendered.

It can be used in combination with other industry solutions developed on the basis of enterprise management and integrated automation configurations. The program provides an integrated information system for managing all production processes at enterprises producing flour, cereals, compound feeds and fat and oil products [8].

The software is designed to service elevators, production workshops, technical laboratories for quality control in production, accounting of a crop production enterprise. It will be useful for the management staff and the administration of the organization. Automation of technological and production processes in crop production will significantly facilitate the work of personnel and fully solve the tasks associated with the control and management of an agricultural enterprise.

Conclusion

Thanks to active digitalization, new crop production industries have been developed, such as precision farming and the introduction of robotic systems at all stages of product cultivation. The introduction of digital technologies in crop production pays off for an agricultural enterprise in the shortest possible time and quickly begins to bring tangible profits. Such results are achieved by reducing product losses during storage and transportation, as well as optimizing the cost of manufacturing agricultural products.

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