

1. Based on the high-frequency method, an experimental device model was created to monitor biomass moisture under production conditions. According to the research results, a prototype installation for biogas production in anaerobic conditions was developed, as stated in the Ministry of Energy's information letter No. 02-07-6168. In economic terms, the implementation of the new version of the biogas process during fermentation led to the creation of 503,766.26 thousand tenge of thermal equivalent, thanks to the optimal operation of the heat exchange mixer and biomass heating. The research results were published in 20 scientific articles in journals of the Republic of Uzbekistan, indexed in 6 SCOPUS scientific journals, and presented at 7 international conferences. Two software creation certificates were obtained for computers (Certificate No. 27796 dated 02.10.2023), and two new patent applications were submitted to the Intellectual Property Agency.

2. Work was carried out to monitor the technological parameters of agro-industrial products (Stage 2), led by Prof. P. Kalandarov. The aim of the work was to assess the moisture content of technological parameters of agricultural products (cotton and cotton products) using a high-frequency control method. As a result of the research, an experimental model for moisture control of cotton under GALLA-ALTEG OJSC conditions was developed. The economic efficiency of the research amounted to 69.2 million sums per installation, as stated in the information letter from Ozdonmax OJSC No. 6-1-2/3-5 dated 05.01.2023. The research results were published in 15 scientific articles in journals of the Republic of Uzbekistan, indexed in 4 SCOPUS scientific journals, and presented at 4 international conferences. A certificate was obtained for computer software registration (1 certificate according to official registration No. 27796 dated 02.10.2023), and 5 patent applications were submitted to the Intellectual Property Agency.

3. The research and development of an automated technology for dosing and mixing in the preparation of irrigation water was conducted under the topic "Investigation and Development of an Automated Technology for Dosing and Mixing in the Preparation of Irrigation Water," supervised by Prof. A. Usmanov. The study focused on the automation of mixing and dosing processes in the preparation of irrigation water, considering technical, technological, functional, and structural aspects in rural or field conditions. The work involved theoretical research, development, and schematic designs of an automated technology for irrigation water preparation and irrigation solutions. Automation tools for monitoring water mixing, dosing, and process control in water preparation were also studied. Based on the conducted research, three articles were published, and two software copyrights were obtained.

4. Research was conducted on the topic "Artificial Intelligence Systems for Water-Saving Technologies," led by Associate Professor A.S. Kabildzhanov. The intermediate results of the work include the analysis of modern water-saving irrigation technologies for gardens and vineyards, identification of key tasks for automating the management of drip irrigation systems for fruit trees and vineyards, systemic analysis of the growth processes of fruit trees and vineyards, identification of the most promising directions and models for intelligent forecasting of the growth processes of fruit trees and vineyards, and the development of an intelligent forecasting model for shoot growth of fruit trees using Long Short-Term Memory (LSTM) neural networks. Based on the conducted research, two articles were published, and one software copyright was obtained.

5. Work was carried out based on the plan for the topic "Development of an Express Method for Determining the Fuzziness of Cotton Seeds in the Primary Processing of Cotton" under the responsibility of Prof. Gazieva R.T. In 2023, with the aim of developing an express method for determining the fuzziness of cotton seeds during primary cotton processing, an express method for determining fuzziness was developed based on the analysis of existing methods, including the methodology for conducting experimental studies. During the reporting period, research was conducted on algorithms for optimal control of continuous technological processes, optimization algorithms for static modes in systems of extreme control using mathematical models, mathematical models of external influences, characteristics of external influences and their estimation, as well as methods for determining the characteristics of complex objects based on fuzzy logic. As a result of the research, three articles were published, and a

license for one utility model was obtained.

6. Work was carried out based on the plan for the topic "Application of an Electroimpulse Therapy Device against Nematode Diseases" under the responsibility of Associate Professor Bozorov E.O. The influence of root stems and plant tissues, as well as the presence of pathogenic microorganisms and nematodes in them, was evaluated from electrical, agronomic, and biological perspectives. The scientific results obtained allowed determining the indicators for treating damaged plants. The study examined the effects of electroimpulse discharges on tomato and cucumber plants grown in a greenhouse heavily infested with nematodes, as well as biochemical changes in the soil composition. As a result of the research, one Scopus and one national journal article were published and presented at conferences.