

II International Scientific Conference GCPMED 2019
"Global Challenges and Prospects of the Modern Economic Development"**QUESTIONNAIRE RESULTS DEPARTMENT OF THE**
DEPARTMENTAL PROJECT "DIGITAL AGRICULTURE"

E. V. Truflyak (a), N. Y. Kurchenko (b)*

*Corresponding author

(a) Kuban State Agrarian University (KubSAU), 13 Kalinin st., Krasnodar, Russian Federation, trufliak@mail.ru(b) Kuban State Agrarian University (KubSAU), 13 Kalinin st., Krasnodar, Russian Federation,
kalya1389@gmail.com***Abstract***

In October 2019, the Center of forecasting and monitoring conducted a survey, there are 73 experts from 33 regions of the Russian Federation took part. In compiling the main issues and identifying promising areas, the plan and tasks for implementing the federal project "Digital Agriculture" of the Ministry of Agriculture of the Russian Federation were taken into account. The questionnaire consisted of 20 questions, 6 questions on the implementation of technological trends in 2020–2030. This project involves the creation and development of the national platform for digital state agricultural management "Digital Agriculture", the module "Agro Decisions", the industrial electronic educational environment "Land of Knowledge". The research shows the prospects for the implementation of technological trends in importance and expected completion dates, shows ways to solve the problem of employment in the agricultural sphere. Various approaches to the implementation of the digital agriculture digital government platform for digital government are being considered. Based on a survey of experts on digitalization in agriculture, it can be stated that most of the specialists from the agro-industrial complex are familiar with the departmental project of the Russian Ministry of Agriculture "Digital Agriculture". At the same time, six proposed projects of digital systems in the program: "Digital technologies in the management of agribusiness", "Digital land use", "Smart field", "Smart garden", "Smart greenhouse", "Smart farm" do not cover all the main directions for digitalization.

2357-1330 © 2020 Published by European Publisher.

Keywords: Precision farming, automation, robotics, monitoring, digital technology.

1. Introduction

The Ministry of Agriculture of the Russian Federation proposed a departmental project "Digital Agriculture", which provides for a range of measures for the implementation of digital technologies and platform solutions in the agro-industrial complex. This project involves the creation and development of the national platform for digital state agricultural management "Digital Agriculture", the module "Agro Decisions", the industrial electronic educational environment "Land of Knowledge". Many of the modern methods are based on remote control and machine vision (Awad, 2019).

2. Problem Statement

Free and open access to information resources will ensure the optimization of production processes, will significantly reduce the costs of enterprises, which should lead to an increase in production indicators both in terms of the volume of raw materials, products, and in terms of financial and economic activity (Truflyak, Skubiev, Tsybulevsky, & Malashikhin, 2019).

The approach considered in the work on the implementation of the national platform for digital state management of agriculture "Digital Agriculture" has the following objectives:

1. The digital transformation of agriculture through the introduction of digital technologies and platform solutions to ensure a technological breakthrough in the agricultural sector and to achieve a two times increase in productivity at digital agricultural enterprises by 2024.
2. Improving the effectiveness of government support measures in stimulating the digitalization of the economy of the agro-industrial complex due to the possibility of identifying and analyzing point problems and conditions that hamper the development of digital technologies in the agro-industrial complex of the studied subject of the Russian Federation, as well as determining the main and most promising digital technologies from the perspective of the agricultural producer.
3. Interagency cooperation for the transfer of data on agricultural land to the digital platform "Digital Agriculture" to ensure subsequent accounting, monitoring, analytics.
4. Phased regulation of the implementation of the departmental project "Digital Agriculture".
5. Creation of a training system for specialists of agricultural enterprises in order to build their competencies in the field of the digital economy in working with digital products and digital technologies.

3. Research Questions

Today, numerous studies by many scientists from many countries are aimed at the technology of precision farming (Costa, Biocca, Pallottino, Nardi, & Figorilli, 2017; Yost et al., 2019). The complex of modern technical means requires a change in the approaches used in production. Also, many farmers are interested in the effectiveness of new technologies and payback periods on the one hand and the level of staff qualifications on the other (Kudinova, Lazareva, Rozenbers, & Rozenberg, 2019). Also, representatives of the ministries of agriculture want more data for modelling and forecasting the state of agriculture for the next planning period. Many scientists propose their forecasting models in different directions of development, for example, calculation of yield or risk of loss. Various models are offered, for example, as in Russia, "Digital technologies in the management of agribusiness", "Digital land use",

“Smart field”, “Smart garden”, “Smart greenhouse”, “Smart farm” and others in other countries. Determining the readiness of the industry for change is the main research task.

4. Purpose of the Study

In October 2019, the Center of Forecasting and Monitoring of the Kuban State Agrarian University conducted a survey in the direction of “Digital Agriculture”. In compiling the main issues and technological trends, the plan and tasks for the implementation of the departmental project were taken into account.

5. Research Methods

The survey was attended by 73 experts (66% – sphere of science and education, 27% – business, 5% – administrative authorities) from St. Petersburg, Moscow; Leningrad, Moscow, Rostov, Penza, Ryazan, Oryol, Volgograd, Sverdlovsk, Samara, Pskov, Tula, Omsk, Smolensk, Kursk, Novosibirsk, Kaluga, Ulyanovsk, Saratov, Voronezh regions; Krasnodar, Primorsky and Stavropol Territories; Republic of Tatarstan, Bashkortostan, Kabardino-Balkaria, Dagestan, North Ossetia, Crimea, Chuvash, Udmurtia, Karelia.

The questionnaire consisted of 20 basic questions, 6 questions on the implementation of promising areas in 2020-2030 and was carried out in a testing format on the site of the center foresight.kubsau.ru. The questionnaires were filled out by experts from October 1 to 6, 2019. Experts who have been participating in the work of the center since 2016 are presented in the section <http://foresight.kubsau.ru/experts/>.

6. Findings

Analyzing the results obtained, it can be stated that most of the experts surveyed have an understanding of the terms digital economy (92%) and digital agriculture (97%). At the same time, 82% of the experts are familiar with the departmental project, on the basis of which the questionnaire questions were prepared.

The majority of respondents (44%) believe that the six proposed digital systems projects in the program are not enough: “Digital technologies in the management of the agricultural sector”, “Digital land use”, “Smart field”, “Smart garden”, “Smart greenhouse”, “Smart farm”.

At some forums held in 2019, it was concluded that the program is generally aimed at large business, but an expert survey suggests the opposite (70% believe that the program is aimed not only at large players in the agribusiness sector, but also at farmers household).

The following are the questions that are indicated on the project roadmap. Expert opinions are less optimistic:

- 52% believe that the share of land users who have introduced the use of elements of digital technology will not reach 50% in 2024;
- 46% are sure that by 2024 no digitization and inclusion in the unified geographic information system of at least 90% of the areas of agricultural garden perennial plantings will be ensured;

- 44% believe that at least 70% of the areas of industrial gardens by 2024 will not be provided with means for collecting data on the state of soils, plants, and the environment;

- 41% believe that the volume of vegetable imports will not decrease due to the introduction of the Smart Greenhouse system by more than 70% by 2024.

At the same time, 53% believe that automated systems for feeding, milking and monitoring the health of livestock can increase milk production by 30-40%.

The main goal of introducing digital technologies and platform solutions is to increase productivity in digital agricultural enterprises by 2 times by 2024, but 42% of experts believe that this will not happen. The following questions relate to the education system and advanced training of agricultural specialists.

Respondents consider it important to create experimental digital farms on the basis of educational and experimental farms of the Ministry of Agriculture of Russia and commercial enterprises (95%). It is advisable to create a system for training specialists in agricultural enterprises in the field of digital agriculture, 99% of respondents believe. At the same time, there is a need to create competence centers on the basis of agricultural universities (98%) and it is advisable to conduct retraining of specialists of agricultural enterprises on the basis of such centers (99%).

45% of experts consider the use of electronic reporting services as well as OFD services (connected cash desks) and labeling (Mercury) as a digital “entry point” for agricultural enterprises. At the same time, subsidizing the acquisition of digital technologies (83%) and concessional lending for the acquisition of digital technologies (88%) will help accelerate the digitalization of the industry.

7. Conclusion

Based on a survey of experts related to digitalization in agriculture, it can be stated that most of the respondents have an understanding of the terms digital economy and digital agriculture, they are familiar with the departmental project of the Ministry of Agriculture of Russia “Digital Agriculture”. At the same time, six proposed projects of digital systems in the program: “Digital technologies in the management of agribusiness”, “Digital land use”, “Smart field”, “Smart garden”, “Smart greenhouse”, “Smart farm” do not cover all the main directions for digitalization.

The implementation of most of the areas may occur in 2021-2030. or after 2030, and not in 2024, as indicated in the program. Accelerating the digitalization of the industry will be facilitated by subsidies and soft loans for the acquisition of digital technology elements.

The urgent direction is the creation of experimental digital farms on the basis of educational and experimental farms of the Ministry of Agriculture of Russia and commercial enterprises, the creation of a system for training specialists in agricultural enterprises on the basis of such centers. Experts refer the presented directions to high importance for implementation in Russia.

References

- Awad, M. M. (2019). An innovative intelligent system based on remote sensing and mathematical models for improving crop yield estimation. *Information Processing in Agriculture*, 6(3), 316-325. [https://doi.org/ 10.1016/j.inpa.2019.04.001](https://doi.org/10.1016/j.inpa.2019.04.001)

- Costa, C., Biocca, M., Pallottino, F., Nardi, P., & Figorilli, S. (2017). Structure of the precision agriculture research in Italy from 2000 to 2016: A term mapping approach. *Chemical Engineering Transactions*, 58, 643-648. <https://doi.org/10.3303/CET1758108>
- Kudinova, G. E., Lazareva, N. V., Rozenbers, G. S., & Rozenberg, A. G. (2019). Environmental Modernization - New Solutions In The Transformation Of The World Economy. In V. Mantulenko (Ed.), *International Scientific Conference "Global Challenges and Prospects of the Modern Economic Development". The European Proceedings of Social & Behavioural Sciences*, 57 (pp. 1491-1497). London: Future Academy.
- Truflyak, E. V., Skubiev, S. I., Tsybulevsky, V. V., & Malashikhin, N. V. (2019). Rice crops remote monitoring and heterogeneities detection algorithm. *Modern Problems of Remote Sensing of the Earth from Space*, 16(3), 110-124. [in Rus.].
- Yost, M. A., Kitchen, N. R., Sudduth, K. A., Massey, R. E., Sadler, E. J., Drummond, S. T., ..., & Volkmann, M. R. (2019). A long-term precision agriculture system sustains grain profitability. *Precision Agriculture*, 20(6), 1177-1198. <https://doi.org/10.1007/s11119-019-09649-7>