

# Designing a professional request of the regional farming community for information-analytical, consulting and research services of agricultural education

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**Abstract.** The article presents the results of a theoretical review of publications and an empirical study of the professional needs of the regional farming community on the example of Stavropol Krai (Russia). The survey in digital format of 174 farmers was conducted with the participation of the Association of Peasant (Farmer) Farms and Agricultural Cooperatives of Stavropol Krai. We carried out the analysis of the actual needs of farmers for effective professional activity in the changing climatic, industrial, technological and socio-economic conditions of modern agricultural production; it was based on the regional expert survey. The information obtained during the study makes it possible to optimize the interaction of the farming community with the research complex of agricultural education in the region (Stavropol Krai, Russia), increase the efficiency of farmers, and contribute to the sustainable development of agricultural production and rural areas.

## 1 Introduction

The relevance of the topic of studying the demands of the farming community in the professional sphere is determined by the actively changing natural and climatic, production and technological, and socio-economic conditions of modern agricultural production. Thus, it is necessary to build an effective professional activity of this category of producers. There are needs of the region in increasing the production of agricultural products with a high level of quality, which is provided by small-scale farm production. In order to successfully overcome the emerging problems in farming, we see the need to expand the participation of agricultural education with high-tech developments, information resources, and consulting services. In turn, the solution of modern production problems in the working mode provides ample opportunities for improving the research and educational process in agricultural education. In general, this determines the high relevance of designing a professional request

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of the regional farming community for research, development, information and consulting services of agricultural education.

To formalize the procedures for collecting information about professional requests in the farming environment, it is advisable to analyze current trends in research in the subject area – professional activity of farmers. In order to reduce the cost of producing farm products, it is important to consider all possible options, including through the optimization of water resources management. The authors of the article Z. Deh-Haghi, A. Bagheri, Z. Fotourehchi, C.A. Damalas show the attitude of farmers to the use of treated wastewater in irrigation systems [1]. It is established that the readiness of the farming community to optimize the costs of agricultural production depends on the quality of water purification – the majority of farmers choose the maximum level of purification. The greatest influence among the factors of choice in favour of cheaper water in irrigation systems was the factor – the absence of health risks. Thus, farmers are adherents of ethical standards in their professional activities and economic issues of reducing production costs cannot be solved by reducing the quality of products. For our study an important conclusion is the need to inform the farming community as fully as possible about the quality of means of production, including water resources. Since the problem of crop irrigation is quite acute in our region in a number of eastern regions, it is necessary to pay attention to the issues of information about the quality of water resources in the theoretical model of studying professional requests of farmers. Speaking about an information resource that provides farmers with quick access to verified information about the quality of water resources for irrigation systems, it is possible to extend this approach to a wider range of production stocks and materials. Also it is needed to offer testing procedures for the farming community, assessment of the quality characteristics of planting material, seeds, fertilizers, herbicides, pesticides, etc.

The promotion of advanced technologies in farming, as a rule, small-scale production is another tool for improving the efficiency of this category of farms. Employment in current production affairs does not allow farmers to spend a lot of time searching for information about possible technological, technical, financial and economic innovations, that can be immediately applied on their farm. Such a role of promoting innovations in farm production can be performed by an information platform and closer cooperation with the research staff of agricultural education through a feedback system. We see an example of the promotion of production innovations in farming in the study of the authors of the article F. Huang, J. Liu, Z. Wang, C. Shuai, W. Li [2]. They conducted an analysis of energy use in rural households in China. The idea of the authors is that the promotion of innovations in the field of solar energy in rural areas of China will reduce poverty and contribute to solving environmental problems. An important conclusion obtained during the study: life skills training and increasing technological literacy among farmers are useful for the development of a new direction – solar energy.

Informing about the current political discourse that is taking place in the agricultural sector and discussing trends in the development of farming also requires a discussion platform. Such a discussion platform could make a significant contribution to what defines farming as a social group of society with all its attributes and functions. In addition, it is important to provide an opportunity to put forward civil and professional initiatives, participate in the discussion of the current and the proposal of new regulatory legal acts, managing the activities of farms. For the future, the development of such a platform will allow taking into account the opinions of representatives of the farming community of different regions and transmit these differences into more effective management decisions, projects, legislative acts, both of individual regions and the country as a whole. This approach in informing and involving small farmers in the modern discourse on food security coincides with the opinion of the author of the article F. Davila [3].

J. Chilemba, C. Ragasa speak about the need to train small farmers and promote advanced technological developments and business models in their study [4]. The Business school development program for small farmers has been expanded to a nationwide scale. The training of farmers was aimed at improving farmers' access to markets and developing competencies for creating profitable agribusiness enterprises. The authors of the article note that according to the results of a representative survey, farmers have become more informed about the organization of agribusiness and the creation of new enterprises. At the stage of the study, the participants reported that in the short-term time horizon, the increase in farmers' incomes was not affected. It is important to consider this question in the development of the study.

Training and improving the level of competencies throughout professional activity is important, including in the agricultural sector. If for large agricultural holdings with a large number of personnel, these tasks are solved by expanding the functionality of employees, who solve related tasks, then for small farms – these are more complex strategies or refusal to improve their skills. The issue of involving farmers in advanced training and building professional competencies is gaining relevance due to the active development of new technologies for tillage and plants, the use of chemicals in animal husbandry. For example, the authors of the article S.A. Mohammed, B.A.J. Ridha talk about the need to attract the attention of farmers to protecting the environment of rural areas from pollution [5]. A significant number of chemicals and fertilizers are used in agricultural production, the unsystematic use of which can significantly worsen the environmental situation in rural areas. Therefore, when formulating a proposal for its services, agricultural education should develop a convenient model of up-to-date professional development for the farming community, taking into account small-scale production, a limited number of workers and their versatility.

We also see a request for advanced training for farmers based on the results of a study by M.N. Rakeet, M.K. Ali [6]. Vegetable growing in protected soil requires a high level of proficiency in methods of combating agricultural pests. The survey found that farmers demonstrate a low level of knowledge and insufficient education in the use of pesticides.

In order for farmers to have access to wholesale markets for agricultural products, it is important to conduct third-party food safety audits. The authors of the article T.M. Schmit, G.L. Wall, E.J. Newbold, E.A. Bihn emphasize that investments in food safety can contribute to both reducing microbial risks and increasing sales of farm products [7]. Accordingly, it is necessary to develop institutional mechanisms for involving farmers in food safety inspections.

In general, the theoretical review of publications in the field of the functioning of farms is the basis for the construction of proposals for agricultural education aimed at improving the efficiency of small-scale agricultural production: digital educational services in crop production and animal husbandry; organization and conduct of audits of activities, products, labour and materials; discussion of agricultural policy, affecting the interests of the farming community; access to current operational information on natural and climatic conditions of agricultural production, etc. These conclusions of the theoretical review were verified in the empirical part of the study.

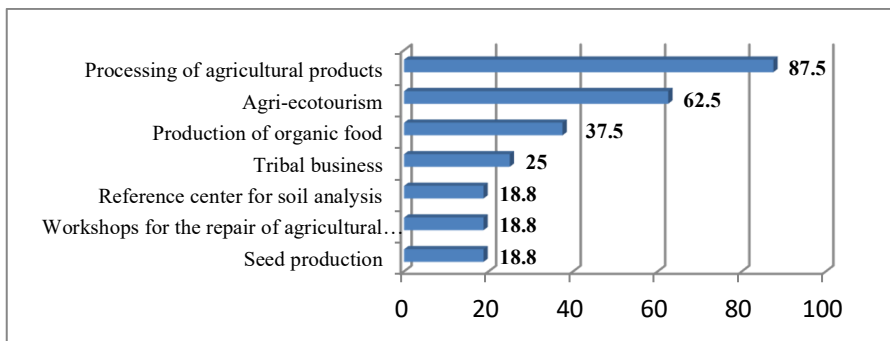
## **2 Materials and methods**

In the empirical part of the study of the professional request of the regional farming community we organized and conducted an expert survey of representatives of the farming community in digital format. In total, 174 farmers, working in Stavropol Krai, took part in it. The Association of Peasant (Farmer) Farms and Agricultural Cooperatives of Stavropol Krai actively participated in the organization of the expert survey. The time period for collecting

primary sociological information was limited to two weeks. The expert survey was carried out in November 2022, using the questionnaire method via Google Form. The data obtained during the expert survey were processed in the SPSS Statistics Program (Version 23) and presented in a generalized form of statistical distributions. The research toolkit included 38 questions, which were combined in information sections: general characteristics of the activities of farms; problems of functioning and development of farming activities; the needs of farmers in the field of information and analytical, consulting and research services; the development of digital processes in the production activities of farmers; socio-demographic characteristics of the members of the expert community.

### 3 Results

According to the results of the survey of the farming community, priorities have been established in the professional needs of Peasant (Farmer) Farms and Agricultural Cooperatives. First of all, the question of interest was: What types of activities farmers plan to develop in the near future? According to the results of the expert survey, it was found that the majority of farmers (87.5%) are focused on processing agricultural products that they would like to organize in their farm (data from Fig.1).

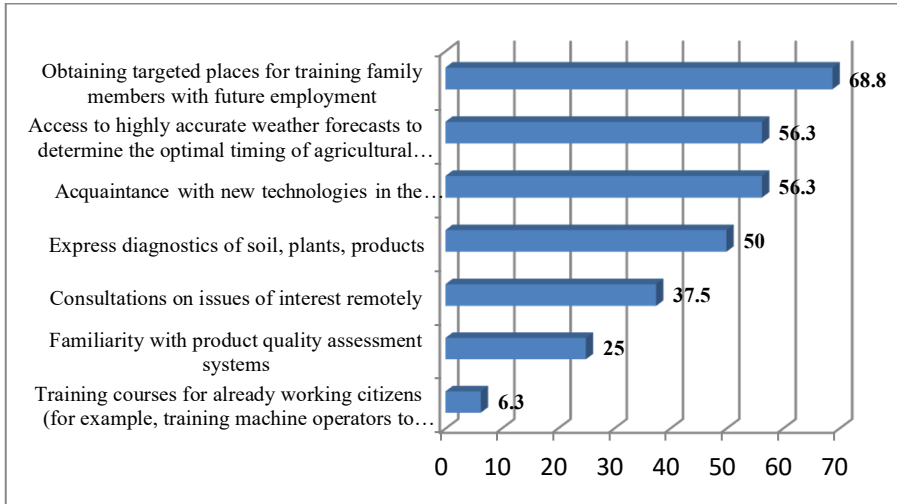


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**Fig. 1.** Distribution of answers to the question “What types of activities do you plan to develop on the basis of K(F)X?” (%)

This is a very promising direction, as it gives an increase in jobs in rural areas, which is important for preserving the labour potential and reducing the migration of the able-bodied population to the city. Accordingly, it is important for agricultural education to formulate interesting proposals related to advanced technologies for processing agricultural products. It is also possible to participate in the implementation of projects – from the stage of developing a package of documents, to the sale of finished products through digital platforms. The high level of readiness of farmers to participate in the development of agro-ecotourism makes it possible to organize tourist projects and combine several farms into common routes. These can be, among other things, student projects and start-ups. There is a large share of commodity producers who support the production and promotion of organic food. Therefore, proposals to join retail chains or Internet sites with an up-to-date brand of organic food also require attention from the agricultural education system, where technologists, marketers, and economists, etc. are trained, who are well acquainted with the specifics of agricultural production and can implement real in-demand projects within the framework of practical training.

The farming community sees areas for interaction with agricultural education in the professional training of family members to continue the family business (data from Fig.2).

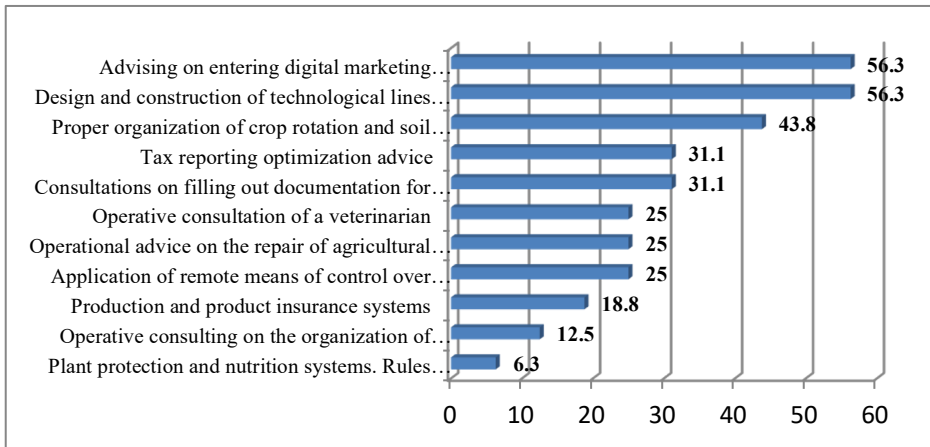


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**Fig. 2.** Distribution of answers to the question “What types of support in the work of K(F)X do you need from Stavropol State Agrarian University?” (%)

There is an opportunity through the organization of a digital platform to provide services in demand by the farming community: access to high-precision weather forecasts and recommendations for optimal timing of field work (56.3% of survey participants); information about new technologies in agriculture and processing (56.3% of survey participants); express diagnostics of soil, plants, products (noted 50.0% of survey participants); remote consultation (37.5% of survey participants).

During the expert survey, Stavropol farmers expressed their opinion on the subject of the consultations in demand, which gives an understanding of the current conditions for the development of farm production. The data, ranked by the degree of significance, are shown in Figure 3.



Compiled by the authors

**Fig. 3.** Distribution of answers to the question “What subject of consultations are you interested in remotely?” (%)

In the remote mode, farmers are interested in the following topics of consultations: access to digital sales platforms for agricultural products; design and construction of technological lines for processing agricultural products; proper organization of crop rotation and soil analysis; optimization of tax reporting; consultations on filling out documentation for obtaining state subsidies, loans, participation in targeted programs, and others.

The information obtained during the study makes it possible to optimize the interaction of the farming community with the research complex of agricultural education in the region, increase the efficiency of farmers, and contribute to the sustainable development of agricultural production and rural areas of Stavropol Krai.

## 4 Discussion

A brief review of the publications revealed research trends that are relevant both for the Russian South with traditionally developed farming and for other regions of the world. Moreover, the general conclusion is the need for the development of farming to ensure the food security of countries, the preservation of rural populations and the development of rural areas, the introduction of new technological processes, institutional transformations, ensuring the quality of agricultural products, the environmental validity of managerial decisions in small-scale agricultural production [8, 9, 10, 11].

## 5 Conclusion

The theoretical analysis of scientific sources, empirical results of the study confirm the relevance of the interaction of the farming community and agricultural education [12, 13, 14, 15]. The starting point of such interaction is the search for promising areas and the specification of the professional request of farmers, as well as the development of institutional mechanisms for long-term operational, tactical and strategic interaction between agricultural education and the farming community. An important role in this process is played by the public association of farmers Association of Peasant (Farmer) Farms and Agricultural Cooperatives of the Stavropol Territory and the development of multifunctional digital platforms that coordinate and provide information and analytical, consulting and research services, as well as the organization of an up-to-date discourse on the development of farming in the South of Russia. Scaling up the experience in other regions of Russia will contribute to the development of farming, providing the population with high-quality food and, in general, improving the country's food security.

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