

Increase of the Competitiveness of Agricultural Production in Global Market (Example of Beekeeping Industry)

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Abstract — Innovative development of agro-industrial complex assumes effective use of scientific and technical potential, integration of science, education and production, technological modernization of economy on the basis of innovative technologies. The solution of this complex task demands creation of appropriate conditions of development of each industry including beekeeping. The specifics of innovative processes in beekeeping are disclosed. In article, it is proved that modern developments of beekeeping are impossible without innovative component, favorable investment climate and the state support. On the basis of the analysis of the market of beekeeping products in the world, Russia and the Tambov region and also a research of opportunities and prerequisites of effective functioning of beekeeping, the main directions of increase in innovative activity in beekeeping are offered.

Keywords: *innovations, innovative activity, competitiveness, beekeeping, Tambov region*

I. INTRODUCTION

Innovative processes in modern agricultural production have a special nature. They cover not only the production of agricultural raw materials, but also the entire multipart process, ending with the processing of agricultural products into final products ready for consumption, and bringing it through trade to mass consumers.

The development of innovations plays a special role for industries that mainly use small-industrial and low-tech industries without the use of large-scale production, to which beekeeping can be attributed.

The beekeeping industry in the production structure of most agricultural enterprises is, as a rule, additional. It has an intersectoral nature and, accordingly, can be considered as an object of unused reserves and opportunities to ensure its own efficiency and related agricultural sectors, as well as a source of valuable food resource.

Russia is one of the largest honey producers in the world, providing about 4 % of the global honey production. At present, Russia shares the 6–8th place with Ukraine and India

in the list of leading world honey producers. In particular, at the end of 2014, our country ranked the 8th place among the largest honey producers in the world with a production volume of 52 thousand tons.

Nowadays, about 5 thousand farms and approximately 300 thousand amateur beekeepers, farmers and cooperatives are engaged in beekeeping.

In terms of the number of bee families, Russia ranks the second place in the world after China, and in terms of production of marketable honey Russia is the fourth, after China, the USA and Mexico.

According to the Federal State Statistics Service, the average per capita consumption of honey in Russia is 350–400 g per year, or about 1 g per day, but according to the agricultural census data, it was 1.1 kg in 2016.

According to Russian Statistic Service, the number of bee families in Russia over the past 5 years was in the range of 3.25–3.45 million and in 2016 amounted to 3.35 million bee families.

TABLE I. STRUCTURAL INDICATORS OF THE NUMBER OF BEE FAMILIES BY REGION OF THE RUSSIAN FEDERATION

Federal district	Number of bee families		Leading Regions of the Federal District	
	<i>thousand</i>	%	<i>Region</i>	<i>thousand</i>
Central	597,5	19,5	Belgorod	66,3
Northwestern	123,1	4,0	Novgorod	29,4
Southern	304,5	9,9	Krasnodar	125,3
North Caucasian	223,7	7,3	Dagestan	142,9
Volga	1173,3	38,2	Bashkortostan	357,2
Urals	135,9	4,4	Sverdlovsk	27,0
Siberian	386,6	12,6	Altai	172,5
Far-Eastern	125,8	4,1	Primorsk	65,5
Total	3070,4	100,0	*	986,1

Russian statistics show only the number of bee colonies and the production of marketable honey in the Russian Federation, federal districts and federal subjects, as well as the

export and import of honey. There is no official data on the situation in other sectors of beekeeping.

II. RESULTS AND DISCUSSION

With the development of market relations, the primary task of the beekeeping industry was to increase the efficiency of production processes and ensure the financial and economic stability of bee farms on the basis of innovative development strategy and growth of investment attractiveness.

Innovative technologies and modern technical means increase the efficiency of beekeeping, facilitate the hard work of beekeepers, especially in small farms. These technologies help to preserve families and improve the quality of manufactured products.

One of the aspects of the technological revolution in beekeeping is the development of the “smart beehive”. This is a device, which is connected to sensors placed in the hive, collects vital medical information, monitors and measures weight, brood temperature, relative humidity and sound level (acoustic scanning) inside the house. All this data can be collected in real time and transmitted through the application on the smartphone. The introduction of digital beehive technology helps beekeepers find out when to start extracting honey, find stolen bee houses, and monitor the health of the colony. [13]

In addition, the use of mobile bee farm is becoming more common in modern beekeeping. The application of this method increases the collection of honey. Bees do not need to spend time and energy to fly to a hive. The entire bee farm is formed in a mobile trailer. The hives are located so that a comfortable temperature is created and there is room for free access to each house. A beekeeper transports beehives during the honey harvest to flowering fields. Inside the mobile bee farm, there are conditions not only for work, but also for a beekeeper to spend the night. During the season, such a farm

brings a much larger amount of honey than stationary. The hives can be stored in the trailer in the winter, which saves space. Serving a large number of hives is easily done by one person. Scientists have developed special microchips that are placed on bees in order to find out the causes of extinction of bee colonies and to help restrain the spread of dangerous parasites.

One of the main tasks of a beekeeper is to maintain comfortable conditions in each hive, especially in the spring. Bees spend a lot of energy on heating, which can affect their reproduction. Scientists developed a special thermal film that warms the hive and creates suitable conditions for the active reproduction of bees. [14]

The introduction of modern, science-based technologies for the production of beekeeping products should be carried out simultaneously with the training of qualified personnel for the industry.

Due to the standardization of beekeeping equipment and the mechanization of labor-intensive processes, the selection and distribution of honeycombs, pumping and processing honey, loading and unloading hives for roaming, etc.) and clear specialization, it is possible to simplify the maintenance of bee colonies and achieve the highest labor productivity in the world in this industry. In this regard, the main path of development of beekeeping in Russia is large specialized enterprises, which does not deny the prospects of farming and homestead (amateur) beekeeping.

The beekeeping market in the Tambov region is a complex system that is characterized in accordance with specified criteria. The characteristics of the market of beekeeping products indicate that the development of market relations led to the creation of a market for beekeeping products, as evidenced by the growth in the production of marketable honey in the region (Figure 1).

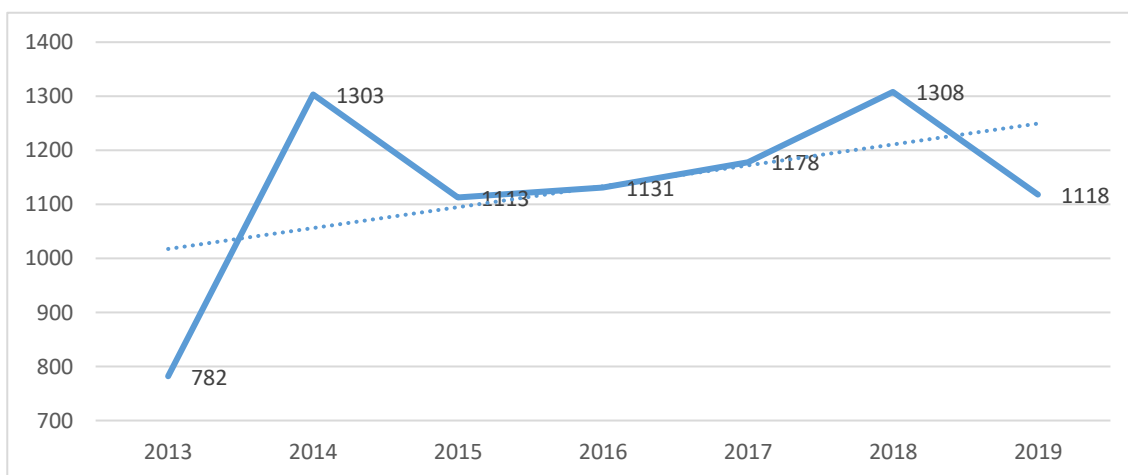


Fig. 1. Production of marketable honey in the Tambov region in farms of all categories, t

At the same time, the main reasons that hinder the development of beekeeping production market at the present stage are the lack of financial support from the state.

The number of threats that Russian beekeeping faces today is growing. Dangerous viral and other bee diseases continue to spread. Under the conditions of financing scientific research related to bee diseases, the true causes of diseases are not determined.

The experts, analyzing the annual death of bees in Russia, believe that the cause of their mass death in Russian bee farms may be insecticide poisoning.

For example, on June 20, 2019, the authorities and beekeepers discussed the problem of mass bee death in the Tambov Region. The dialogue was led by Sergey Khaustov, Vice Governor Sergey Ivanov, Chairman of the Committee on Agrarian Issues, Ecology and Nature Management of the Tambov Regional Duma, Alexey Filin, Head of the Veterinary Department of the Region, Lidiya Bakumenko, Deputy Head of the Department of Agriculture of the Region and Tatyana Perederiy, the Chairman of Tambov-Accor. [5]

Together with the initiative group of beekeepers and representatives of public organizations of farmers, a decision was made to initiate the introduction of a regional law on beekeeping in the Tambov Region, which would regulate the interaction between beekeepers, farmers, veterinary service and municipal authorities.

However, the regional laws on beekeeping adopted in 35 subjects of the federation do not solve the problems of beekeeping and bee producers, since the roots of many problems are located outside the regions. In other words, the state of Russian beekeeping is extremely negatively affected by the absence of a federal law on beekeeping, designed to protect the interests of this industry and its participants.

The significant factor in the increase of production efficiency in beekeeping is not only technological, but also organizational and economic innovation. Thus, the discussed "Dobropchel" digital platform, designed to coordinate the actions of farmers and beekeepers, seems quite effective, since it will allow beekeepers to receive timely alerts about the processing of fields with pesticides and herbicides in advance, which will ensure monitoring of the logistics of mobile bee farms and the safety of bees. [16]

The world experience in the organization and regulation of the market for beekeeping products indicates that the functioning of this market is carried out with the active support of the state, which includes, first of all, budgetary subsidies and state subsidies to producers of these products. In the foreign market of beekeeping products, the high paid rent of bee families by crop enterprises for the flowering period of entomophilous crops is widespread. According to many experts, the cost of products obtained from pollination significantly exceeds the cost of direct beekeeping products. The distribution of the Dobropchel digital program, as well as the joint use of regional and federal legislation, will prevent the mass death of bees.

However, today Russian beekeeping has exhausted internal reserves for development and needs help from the state as never before. State programs for the protection and development of beekeeping are adopted and are being implemented in 50 of 150 countries with developed beekeeping. The mass death of bees in many regions of the world in recent years gained such proportions that FAO, UNDP, UNEP, and other reputable international organizations joined the search for ways to protect bees and other pollinating insects.

There is an urgent need to include beekeeping industry in government programs on the provision of favorable investment climate and state support at all levels through differentiated subsidies and preferences.

The transition of beekeeping to market dimension is associated with the creation of a competitive, mainly large-scale commercial production. Based on it, the intensive development of the industry is possible, as well as widespread use of the achievements of scientific and technological progress and a significant increase in the volume of products. At the same time, the measures of state regulation and investment support are of growing importance for the development of beekeeping. Modern machines and equipment necessary for innovative activities are expensive and, as a result, are not always available for a significant number of beekeepers. Therefore, one of the most important areas for the development of beekeeping is the wide distribution of various forms of cooperation (production, consumer, procurement, supply and marketing, credit etc.).

The remedial action in the wake of the crisis state of the industry in the coming years may be faster provided that the role of regional agro-industrial complex management bodies grows. Their activities within the framework of the expansion of legislative legal support confirm their usefulness with the examples of a number of regions in which the law "On beekeeping" has already been adopted and is widely used in business practice and other regulatory and legal acts.

In the future, it seems advisable to develop a network of beekeeping organizational structures at the level of administrative districts (associations, partnerships, cooperatives), which, in close contact with regional authorities, agricultural and beekeeping departments, could solve the development of beekeepers and individual crop branches. For this purpose, at the first stage at district administrations (departments) of agriculture, it is advisable to introduce the position of a zootechnician (agronomist) in beekeeping, as it was in the pre-reform period, as well as to revive the practice of harvesting raw materials and beekeeping with the involvement of consumer cooperation organizations.

III. CONCLUSION

Thus, the main directions of the increase in innovative activity in beekeeping consist not only in enhancing activities of the direct executors of the innovation process, but also in the system of certain state measures in order to activate the process itself, which may include the following:

- state support for the scientific and innovative sphere as a whole in the agricultural sector and in the industry;
- attachment of the activities of scientific institutions directly to the requests of producers and processors of honey;
- functioning activation of all organizational forms of the innovation process to assist agricultural producers in the introduction of scientific and technological achievements;
- organization of mass retraining of personnel at all levels of the innovation process;
- development and implementation of a system of economic incentives for the further development of the innovation process in this industry;
- implementation of purpose-oriented programs at state, industry and regional scientific and technical levels;
- further improvement of organizational forms of the introduction of innovations in beekeeping.

The realization of these areas will contribute to the effective development of the industry, the restoration of its significance and profitability. The main factors for the creation and successful functioning of the innovation infrastructure in beekeeping are the existing scientific and technical ground and the state policy in the field of agricultural development carried out at the present stage.

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