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Agricultural insurance: Vegetable production efficiency increase

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ABSTRACT

Fresh and processed vegetables are included in our diet every day. Due to vegetables the human body receives the bulk of the vitamins and minerals necessary for life. Considering the special role of the vegetable growing industry in population provision with the necessary fortified products, topical issues of the industry efficiency and investment attractiveness increase are of strategic importance for the country food security and for import substitution problem solution for fresh vegetable products. The development of domestic vegetable growing is under close scrutiny of state authorities at both the federal and regional levels. Significant development funds are allocated annually by the budgets of various levels. The current support measures include compensation for the part of the interest rate on loans (soft loans), reimbursement of capital construction costs, agricultural-technological work, soil fertility increase, etc. Thanks to these support measures, vegetable growing in Russia has become highly effective and it contributes to import substitution. At the same time, the allocated funds and agricultural production must be financially protected from uncontrolled natural anomalies. Agricultural insurance is a reliable way to protect the property interests of an agricultural producer from the impact of natural disasters. The study examined the Russian and foreign experience of agricultural insurance. Much attention is paid to the application of the statistical research method. Taking into account the problematics of the research topic and its poor study, this work makes a great contribution to the scientific literature. The need for agricultural insurance is referred to the main result of the study, and is recommended in planning the activities of agricultural production.

Keywords: Agricultural risks, Open ground vegetable growing, Agricultural insurance, World insurance experience.

INTRODUCTION

Vegetable growing is the branch in agriculture that produces products, develops and improves technologies for vegetable growing in open and protected ground conditions (Bunin, Meshkov, Terekhova & Konstantinovich 2013). Vegetable growing in open ground in Russia makes it possible to provide the population with the products of more than 25 types of vegetable crops, such as white cabbage, onions, carrots, table beets, potatoes, cucumbers, sweet and hot peppers, tomatoes, zucchini, scallop, pumpkin, etc. The main agrotechnical measures which allow to ensure consistently high productivity of vegetable crops: the use of high-quality seeds of the varieties and hybrids most productive and resistant to diseases and pests, observance of crop rotation with the correct alternation of crops, irrigation, the use of organic and mineral fertilizers, biological growth stimulants and the means of protection against pests and disease (Belik *et al.* 1981).

The main features that characterize open field vegetable growing: A high proportion of manual labor in the cultivation of vegetable products. The highest values of labor costs are characteristic of product cleaning, because many vegetable crops can only be harvested by hand.

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High demands of vegetable crops to the level of soil moisture, which can be provided only by irrigation, while grain and ind ustrial crops have enough moisture obtained from atmospheric precipitation and accumulated during the snow melting period. The demand of vegetable crops to temperatures during the growing season allows to be grow them only in the regions of the Russian Federation that are most favorable for this factor. Low transportability and short shelf life. Unlike cereals and industrial crops, the products of many vegetable crops can be transported only in the transport that provides an optimal temperature regime during the entire period of transportation and due to the high-water content in products, the shelf life of some types of vegetable crops can be 1-2 week only. The purpose of this study is to develop and substantiate certain methods of vegetable growing protection from negative factors affecting the production of final products and the effectiveness of industrial vegetable growing in open ground.

MATERIALS AND METHODS

To analyze the industry under study, general scientific and specific methods of economic research were used. Abstract-logical and economic-statistical methods made it possible to study the essential signs of vegetable growing development in Russia. With the help of economic, mathematical and monographic methods, they considered the role and experience of agricultural insurance. Scientific generalization is given and industry application recommendations are developed.

RESULTS

Estimating the indicators of the total sown area and the gross volume of vegetable crops produced, Russia is one of the ten largest producers in the world. However, if we take into account the yield, then Russia occupies only 57th place. According to the official statistics for 2019, the greatest development of the vegetable growing industry was noted in the southern regions of Russia, where the leaders in terms of production of outdoor vegetable products are the following ones: Astrakhan region - 22.0% from the total production of vegetables in the industrial sector of vegetable growing, Volgograd region - 14.2%, Krasnodar region - 7.5%, Kabardino-Balkar Republic - 5.8%, Moscow region - 5.6%. Other regions of the Russian Federation accounted for 29.7% of the total industrial production of open field vegetables (Agribusiness expert and analytical center "AB-Center").

A characteristic feature of modern vegetable growing in Russia is the insufficient provision of the population demand for fresh vegetables. Agricultural organizations do not fully meet the demand for this product, the consumption of which lags far behind in comparison with the indicators of European countries. The annual production of vegetable products in Russia makes 14-16 million tons, which in general makes it possible to provide 106 kg per person with the medical norm established by the Institute of Nutrition of about 140 kg. At the same time, the countries of the European Union (except Scandinavia) and the USA produce up to 200 kg per person, and China produces 400 kg per person (Santeramo *et al.* 2018). Incomplete provision of the domestic consumer market with vegetable products is mainly compensated by imports. In 2019, more than 1.5 million tons of vegetable products were imported into Russia. The reasons for the shortage of domestic vegetable products are a set of problems and the lack of their solution so far. The main ones are the following:

1-Low level of technical and technological support for the majority of agricultural enterprises;

2-A high proportion of manual labor in the cultivation of vegetable products;

3-Insufficient level of government subsidies for the industry;

4-Significant impact of agrometeorological conditions;

Industrial vegetable growing in Russia is characterized by high production costs. In this regard, it is difficult for vegetable farms to compete not only with foreign producers, but also with the producers of grain and industrial crops. Open field vegetable growing requires significant financial investments and resources. The cost of a hectare of soil cultivation for vegetable growing can be several times higher than the cost of barley or sunflower production. The agrarian business takes place in conditions of constant risks. Among the many risks, there is one that has the maximum impact on the economic efficiency of an enterprise - natural and climatic.

Obtaining high yields of vegetable products in open ground is possible only under favorable climatic conditions. Even the most modern technology does not allow full control of the conditions necessary for the growth and development of vegetable plants. And if with the help of irrigation, it is possible to compensate for the lack of atmospheric precipitation, then it is almost impossible to foresee the unfavorable factors of climatic conditions. Agricultural enterprises specializing in the production of vegetable products within open field conditions annually

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incur significant losses from local natural disasters: abnormal temperature fluctuations, hail, torrential rains, hurricane winds and other emergencies. At that, financial damage as the result of emergencies is often not only equal to the economic results of enterprise activities, but sometimes even exceeds them. Organization of the production process differs in different ways of risk management. They develop all kinds of technological schemes and the options to reduce the impact of agrometeorological risks. Various preventive and compensatory methods are used to fight against damage from natural disasters. Preventive methods are aimed at preventing the impact of hazardous events (for example, fire prevention measures, the measures to combat diseases and pests, etc.). Preventive measures help prevent damage. The compensation method includes the compensation for damage from the state budget and agricultural insurance. It should be noted here that assistance from the budget in the form of compensation is always less than economic damage and it is always not worth relying on its payment. Insurance is the most important method of protection against weather risks and allows you to maintain the financial stability of enterprises involved in outdoor vegetable growing. It should be noted that the insurance of agricultural crops has been compulsory for more than 100 years. In 1930, 81% of the sown area was insured in the USSR. Insurance did not stop even during the Great Patriotic War, which made it possible to maintain uninterrupted production and ensure the supply of food to the front. And subsequently, compulsory insurance in the USSR contributed to the development of agricultural production and the supply of high-quality products to the population.

World practice indicates that government bodies pay great attention to the support and development of agricultural insurance. State support for insurance is being implemented through the creation of special institutions (associations), as well as via subsidy programs. At present, insurance in Russia is voluntary and regulated by special laws. In order to support development, the law "On State Support in the Field of Agricultural Insurance and on the Amendments to the Federal Law "On the Development of Agriculture" was signed in 2011 (Government of the Russian Federation 2011). Insurance with state support is carried out against the loss (destruction) of crops, animals and perennial plantings. The state pays half of the insurance contract cost (insurance premium) to the farmers who have entered into an agreement with state support. This mechanism allows to reduce the financial burden on agricultural producers. Despite the subsidizing of the insurance premium, there are not so many volunteers among the farmers who want to insure their risks, unless these are bank pledges. Farmers believe that insurance companies are not paying. In practice, many agricultural producers who have faced the losses resulting from natural hazards have become convinced of insurance effectiveness as a reliable way to protect property and financial interests. Another reason for the poor development of agricultural insurance is the mentality of the majority of farmers. It does not yet allow the perception of insurance as a necessary tool to protect their property interests. To change it, it is necessary to understand that agricultural insurance is the same part of the agricultural business as the purchase of seeds, fuel and lubricants, and labor costs. The reason for this may be the agricultural insurance system that existed in the post-Soviet period until 2012, which had a number of significant shortcomings and did not guarantee timely insurance payments to affected farmers. The situation was triggered by the lack of insurance standards and calculation loss. Agricultural risks were insured by a large number of small companies that were unable to handle large losses, such as those caused by drought (Spletukhov 2018). In order to change the existing system, they developed a new system of agricultural insurance, carried out with state support. New approaches to the agricultural insurance system allow to protect the rights and interests of agricultural producers, as well as to create additional opportunities for protection against risks (Nazarova 2015).

The actions currently being taken by the Government of the Russian Federation contribute to the development of effective and affordable insurance, which ensures the financial stability and economic development of agricultural production. Insurance should be the main tool for agriculture support. This conclusion has also been recently reached by lawmakers around the world considering the complete abandonment of direct subsidies to farmers in favor of state support for agricultural insurance (US Department of Agriculture, USDA), Ministry of Agriculture, Fisheries and Food (Spain). The financial position of domestic agricultural producers is currently highly dependent on government subsidies. But support for farmers, including the producers of vegetable products, will become an unpopular measure as soon as the agricultural industry becomes economically stable and there will be no more massive infusion of budget funds. In turn, farmers' incomes and their financial well-being should be protected by the agricultural insurance system and not be dependent on natural risks. On the example of a separate enterprise, they carried out the study on the way agricultural insurance affects the activities of an enterprise for tomato growing in an open field. A modern agricultural holding, which has a tomato processing plant in its structure, a greenhouse complex for growing seedlings, an agricultural division that grows raw materials in an

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open field, and other auxiliary and providing production and communications, must work smoothly at any production stage. Sudden natural hazards that lead to the death of products grown in the open field can also lead to the failure of the entire chain of final product production and, thus, to the financial problem of the agricultural holding.

To achieve the main goal - making a profit, the company needs to protect itself from such risks such as frost, hail, pests, and diseases. Risk reduction is possible through the use of modern agrotechnical methods that reduce the likelihood of the grown tomato death from diseases and pests, as well as the transfer of crop death risk from frosts and hail to insurance. For an agricultural holding with the fields of 5,000 hectares the cost of insurance will become a fairly large cost item, approximately 20-50 million rubles, depending on the conditions of insurance. But due to subsidies from the budget, the expenses of the agricultural holding for insurance will amount to 10–20 million rubles. The agricultural insurance law stipulates that the manufacturer pays 50% of the insurance premium. According to the aforementioned law on agricultural insurance, the future harvest of the agricultural holding will be provided with insurance protection against natural hazards in the amount of more than 1.5 billion rubles. The presence of an insurance contract is also the condition for state subsidies obtaining in other areas of state support, and it also gives the right to receive additional compensations from the budget in full in case of natural emergencies.

Taking into account the peculiarities of the tomato production cycle, let us assume that some of the fields suffered from autumn frosts on an area of approximately 1,000 hectares, which led to damage during the insurance contract period due to non-receipt of products in the amount of 300 million rubles. Taking into account the insurance conditions, the agricultural holding will be able to compensate its financial losses by 150 million rubles at least using the agricultural insurance mechanism, which is significantly higher than insurance costs.

DISCUSSION

The increase of damage from natural hazards is evident not only in the Russian Federation, but throughout the world (Jensen & Barrett 2017; Meuwissen & van Asseldonk 2018). After the abnormal drought in 2010, 13.3 million hectares of agricultural land were affected, and the damage amounted to over 40 billion rubles (Skrynnik 2011). Federally regulated crop insurance programs have been the part of US agricultural policy for over 80 years. The Agriculture Law of 2014 strengthened publicly subsidized insurance and made it the primary location for channeling funds to the agricultural sector (Ker *et al.* 2016). Agricultural insurance markets were created in Europe over 200 years ago in the form of private protection against livestock deaths and dangerous events. However, during the last 50 years alone, there has been a rapid increase of insurance product volume offered to the manufacturers with government support (Smith & Glauber 2012). Open field vegetable growing is possible only under favorable climatic conditions. Natural disasters reduce the sustainability of agricultural production and negatively affect the development of agricultural business (Kurnosov, Kamalyan & Nazarenko 2002), which determines the relevance of insurance in agriculture (Nilipovskij & Dolgorukova 2007).

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