State regulation and the main ways to support the development of agricultural insurance in Russia and in foreign countries

O A Obraztsova* and A V Agibalov

Voronezh State Agrarian University named after Emperor Peter the Great, Faculty of Economics, Department of Finance and Credit, d. 1, Mitchurina St., Voronezh, 394087, Russia

* E-mail: dacha03@mail.ru

Abstract. In our work on the basis of economic literature, statistics and scientific works in periodicals, we analyzed the international experience of conducting agricultural risk insurance in other countries, special attention was paid to issues of state support for this industry. As a result of the study, we identified the features of conducting agricultural insurance abroad, which can be further adapted to the conditions of the Russian insurance market and applied in order to improve and develop the mechanism of agricultural insurance in our country. The article also examined the dynamics of the main economic indicators of the development of the agricultural insurance market with state support. The main indicator of market development is the share of insured sown areas and livestock of farm animals. The dynamics of these indicators over the past six years has shown that the level of agricultural insurance protection in our country is at a low level, despite the fact that in 2019 there was a positive trend to the world average indicators is still very far away. Much attention was paid to indicators characterizing the level of state support for this industry in our country. As a result of research, it was determined that the agricultural risk insurance system lacks budget funds, and its development directly depends on the amount of funding. It should also be noted that large agricultural producers are mostly involved in the insurance process, and for small-scale farming, the proposed insurance products are mostly inaccessible due to the high cost. Further, the main problems of the development of the agricultural insurance mechanism were identified and directions for improving the state support system for this industry were outlined.

1. Introduction

Supporting agriculture has always been the primary task of the state. The high level of development of the country's economy directly depends on the development and stability of this industry. This issue was particularly acute for Russia during the period of severe economic sanctions, when ensuring food security and increasing agricultural production became one of the priority areas of economic development.

Agricultural production, as one of the riskiest industries, has always needed state support. Catastrophic risk losses tend to be large-scale and costly for budgets at different levels to overcome. In recent years, our country has paid great attention to the development of agricultural insurance.

International experience of agricultural risk insurance suggests the need for state support, in one form or another. This issue was considered by scientists such as P. Zhang (2021), M. Palma (2021), T.
Dalhaus (2020), Y. Zhang (2019), P. Ward (2019), G. Schnitkey (2020), N. Paulson (2020), E. A. Tokareva (2015). Their work was aimed at analysing the existing agricultural risk insurance system in various countries and developing ways to develop it. However, the modern experience of conducting agricultural insurance in Russia indicates the need to improve it and increase the level of coverage by insurance of all sectors of the agro-industrial complex. All this indicates the relevance and significance of our research topic.

2. Formulation of the problem
The purpose of the work is to study the international experience of agricultural insurance and adapt advanced measures of state support for this industry in the conditions of the modern insurance system of Russia, as well as analyze the main economic indicators of its development and identify problems that impede the promotion of insurance relations in agriculture. Development of directions of improvement of this industry and methods of optimization of state support for agricultural insurance in the Russian Federation.

3. Results
Agricultural production insurance is widely used in world practice as one of the effective methods of protection against the influence of negative factors on the results of agricultural producers. The international experience of state support for agricultural insurance is characteristic of most countries of the world, from the data of the National Union of Agricultural Insurers, we see that the level of insurance protection in the countries of competitors in wheat production ranges from 15% to 90%, in our country it is less than 2%. This indicates the need to develop and improve the agricultural risk insurance mechanism used in our country (Figure 1) [6].

![Figure 1. Level of coverage of wheat crops with insurance on the world market, 2017-2018.](image)

Most countries in Europe, as well as the United States, China and Turkey, use subsidies for insurance premiums under agricultural risk insurance contracts as the main form of government support. At the same time, it should be noted that 90% of the collected insurance premium falls on crop production insurance, since this industry is more affected by negative weather factors and is considered the riskiest (Figure 2, 3) [15, 18].
The world practice of agricultural insurance is based on laws and regulations. As a rule, the laws deal only with basic approaches, and the regulations, depending on the needs of the participants in the insurance process, specify specific conditions and approve various insurance programs. A similar order is used in the USA, Spain and Turkey [2].

Today, the United States and Spain have advanced experience in state support for agricultural risk insurance, its high effectiveness is confirmed by the wide range of insurance coverage and the demand for developed insurance programs [14]. The Bank of Russia proposes to introduce a similar approach to agricultural risk insurance in Russian practice [7].

![State participation in agricultural insurance (Swiss Re)](image)

**Figure 2.** State participation in agricultural insurance (Swiss Re).

In the USA, the Federal Crop Insurance Corporation (FCIC) develops government-supported insurance programs. Such programs can be developed by the insurers themselves in the future after their approval by the FCIC they are also included in the state support system. According to these insurance programs, public funds are allocated to compensate for the costs necessary for the implementation of the program [12, 15].

In USA practice, more than 10 major insurance programs are applied, including crop failure insurance, index insurance and animal insurance with various coverage options [8].

In Spain in 2015, there were about 50 agricultural risk insurance programs with state support [14].

In order to involve in the process of agricultural insurance with state support for small forms of economy, three mutual insurance societies operate in the USA, similar experience is also used in Europe and Latin America [15].
According to world practice, small farmers most often prefer index insurance. This is an alternative to classical types, its feature is that a specific loss of an individual farm is not estimated here, and the amount of compensation depends on the influence of individual factors and is calculated according to a predetermined model [2].

![Figure 3. Public Support Systems in the World (Swiss Re).](image)

This type of insurance greatly simplifies the procedure for concluding a contract and settling losses, and also does not require constant maintenance, but at the same time, as its shortcomings, it must be noted that it requires a large amount of preliminary work and processing of an array of statistics.

This type of insurance has become widespread in India, Mexico, China and Thailand. These countries are characterized by a spread of small agricultural producers in a large area. Index insurance is also used in developed countries such as the USA and Spain [16-17].

There are several index insurance programs in the USA.

- **Group Risk Plan (GRP)** - the program involves the coverage of significant territories. As the main indicator, the average yield for the area, which is calculated on the basis of data from the National Agricultural Statistics Service (NASS). Under the terms of this program, insurance compensation does not depend on the yield of the agricultural producer, but is paid when the yield in the area decreases, taking into account the coverage level chosen by the insured (up to 90%). Contract maintenance and loss settlement costs are significantly lower than with classic insurance, so its cost will be significantly more affordable [19].

- The next index insurance program in the United States is **Group Risk Income Protection (GRIP)**. It is similar to the program on the yield index, but its difference is that it is based on estimated income in the area, here the price of the crop is compared.

- **Rainfall Index (RI)** - insurance based on the rainfall index. It reflects the deviation of the average rainfall in a certain area over a certain period of time.

- **Vegetation Index (VI)** - insurance based on the vegetation index obtained from satellite images.
Today, the most common types of index insurance are weather index insurance and yield index insurance.

As a result of the study and analysis of the experience of agricultural insurance in other countries, we have identified a number of features of its organization, which include the following:

1. Flexibility of the legal and regulatory framework on agricultural risk insurance, which allows taking into account the needs of insurance participants and the characteristics of a particular object;
2. A large number of state insurance programs allow each insured to choose the optimal conditions of insurance protection that meet its requirements;
3. Involvement in the process of agricultural insurance with state support for small forms of economy, which are especially in need of insurance protection;
4. Participation of mutual insurance companies in the agricultural risk insurance system with state support;
5. A wide range of index insurance programs are in place to significantly reduce insurance costs and make them more affordable;
6. Application of new technologies in agricultural risk insurance.

The practice of international experience to a large extent in order to improve the mechanism of agricultural risk insurance in Russia can be adapted to our conditions and applied as an alternative or supplement to classical insurance.

Agricultural insurance in Russia is represented by two types, insurance with and without state support, a large share of the collected insurance premium falls on state insurance, this is due to the high cost of insurance services and the low level of free cash from most potential insurers [2].

Agricultural risk insurance programs without state support are mainly applied to collateral property, when the conditions of insurance with state support do not fully suit potential creditors.

Agricultural insurance with state support is carried out on a voluntary basis, the state subsidizes 50% of the insurance premium, which is transferred to the account of the insurance company that concluded the contract. The objects of insurance are crops and perennial plantations, animals and aquaculture. Insurance is carried out both according to the multi-risk program and according to the list of individual risks. The procedure for conducting insurance with state support is regulated by the Federal Law of 25.07.2011 No260-FZ (ed. From 01.05.2019) "On state support in the field of agricultural insurance and on amending the Federal Law" On the Development of Agriculture" [11].

One of the indicators of sustainability and confidence in the insurance system with state support is the number of agricultural producers who took part in this process. In 2019, their total number amounted to 1911 units, which is more than six times higher than last year and indicates a positive trend in the development of agricultural insurance. These are the highest numbers in four years.

Agricultural risk insurance with the involvement of public funds is mostly carried out by large agricultural organizations, the number of small forms of management involved in the insurance process is insignificant.

Throughout the analyzed period, the number of agricultural producers to which subsidies were brought decreased annually and only in 2019 there was a positive trend, under crop and perennial crop insurance contracts it grew almost 4 times and amounted to 1219 households, under agricultural animal insurance contracts the growth was less significant and amounted to 40 units.

The number of large agricultural organizations that received risk insurance subsidies in the crop and livestock industry in 2019 also increased significantly compared to last year and amounted to 808 and 275 units, respectively. As for small agricultural organizations involved in the insurance process, their number changed ambiguously in 2019, the number of farms that received a subsidy under crop and long-term crop insurance contracts increased by 365 units and amounted to 411 households, and the number of farms that received a subsidy under agricultural animal insurance contracts decreased by 8 units and amounted to 12 farms.

This indicates the absence of agricultural risks in the insurance system with state support for insurance programs that meet the needs of small forms of management and the inaccessibility of
insurance protection for this category of potential insurers, especially for the livestock industry (Table 1) [1].

**Table 1.** The number of agricultural producers who received subsidies for the payment of part of the insurance premium under agricultural crop insurance contracts and planting of long-term plantations in 2014-2019, units.

| Indicator name | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2019/2018, % |
|----------------|------|------|------|------|------|------|--------------|
| The number of agricultural producers to whom subsidies are brought is total: | 5827 | 2751 | 913 | 321 | 310 | 1219 | 393.2 |
| including: | | | | | | | |
| agricultural organizations | 3442 | 1854 | 774 | 280 | 264 | 808 | 306.1 |
| peasant farms and individual entrepreneurs | 2385 | 897 | 139 | 41 | 46 | 411 | 893.5 |
| The number of agricultural producers to whom subsidies are brought is total: | 526 | 345 | 283 | 274 | 247 | 287 | 116.2 |
| including: | | | | | | | |
| agricultural organizations | 429 | 311 | 260 | 269 | 227 | 275 | 121.1 |
| peasant farms and individual entrepreneurs | 97 | 34 | 23 | 5 | 20 | 12 | 60.0 |

The main benchmark and indicator of the development of agricultural insurance is the coverage of sown areas and the amount of insured livestock in the total mass.

Over the past six years, the share of insured sown area reached its maximum value in 2014 (17.1%), then there was a systematic decrease in this indicator to 1.7% in 2018 and only in 2019 there was a positive trend, the indicator grew by 3.9 percentage points and amounted to 5.6%. This is primarily due to the reform of the regulatory framework governing insurance relations in this industry and the allocation of funds aimed at compensating for agricultural risk insurance costs from the total "single subsidy" (Table 2).

**Table 2.** The ratio of the total sown (planting) area of crops and the sown (planting) area under crop insurance contracts and planting of long-term plantations concluded with state support in 2014-2019

| Indicator name | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2019/2018, % |
|----------------|------|------|------|------|------|------|--------------|
| Sown (planting) area - total (excluding households), million ha | 75.0 | 75.9 | 76.7 | 77.5 | 76.8 | 77.7 | 101.2 |
| Sown (planting) area under crop and perennial crop insurance contracts, million hectares | 12.8 | 8.3 | 3.8 | 1.8 | 1.3 | 4.3 | 332.4 |
| Share of insured sown (planting) area, % | 17.1 | 10.9 | 5.0 | 2.3 | 1.7 | 5.6 | 329.4 |
The degree of insurance coverage of the livestock industry is characterized by the proportion of insured livestock, during the analyzed period it changed randomly, in 2015, there was an increase of 1.3 percentage points, from 16.6% to 17.9%, then for two years there is a decrease in this indicator to 13.7% in 2017 and only in 2018 there was a positive trend of 3 percentage points in 2018 and another 5.7 percentage points in 2019. The maximum degree of insurance coverage was achieved in 2019, it amounted to 22.4%. All this indicates the impact of visible changes in the field of agricultural risk insurance in 2019 (Table 3).

Table 3. Ratio of the total number of farm animals and livestock under agricultural animal insurance contracts concluded with state support in 2014-2019 in the field of agricultural risk insurance in 2019

| Indicator name | 2014  | 2015  | 2016  | 2017  | 2018  | 2019  | 2019/2018, % |
|----------------|-------|-------|-------|-------|-------|-------|--------------|
| Livestock of farm animals - total (excluding thousand households), conditional heads | 25906 | 26637 | 27688 | 28281 | 28864 | 28628 | 99,2          |
| including the number of farm animals under insurance contracts, thousands of conditional heads | 4303  | 4777  | 4046  | 3879  | 4818  | 6407  | 133,0        |
| Share of livestock, % insured | 16,6  | 17,9  | 14,6  | 13,7  | 16,7  | 22,4  | 134,1        |

The amount of subsidies allocated by the state to compensate for part of the costs of insuring agricultural risks directly affects the development of this industry, often the degree of insurance coverage is mostly limited by the amount of funds provided, since insurance carried out on a commercial basis without state participation is inaccessible to a wide range of agricultural producers.

The total amount of subsidies provided during the analyzed period from 2014 to 2018 decreased annually from 6426.3 million rubles, to 1051.2 million rubles, in 2019 this indicator grew by almost 2 times and amounted to 2040.9 million rubles.

Most (68%) of the funds provided were paid under crop and perennial crop insurance contracts, agricultural animal insurance accounts for 32%. The maximum amount of subsidies provided for agricultural risk insurance for the crop industry was provided in 2014 (6033.1 million rubles), in subsequent years its size decreased and in 2018 amounted to 523.3 million rubles, which is almost 12 times less than 2014 data. In 2019, the amount of financing increased by 867.3 million rubles. and amounted to 1390.6 million rubles.

In animal husbandry, changes in the amount of funding for this article were not so large. The maximum amount of subsidies was allocated in 2019, it amounted to 650.3 million rubles, in previous years this indicator ranged from 266.4 million rubles. in 2016 to 527.9 million rubles. in 2018.

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To compensate for part of the costs of insuring agricultural risks, in terms of insurance programs with state support, funds are allocated both from the federal budget and from the budgets of the constituent entities of the Russian Federation. In 2019, 1,641.3 million rubles were allocated from the federal budget for these purposes, in particular, under 1122.6 million rubles under crop and perennial crop insurance contracts and 518.7 million rubles under animal insurance. The budgets of the constituent entities of the Russian Federation for compensation of agricultural insurance costs in 2019 allocated 399.5 million rubles. of which 268 million rubles. for crop and perennial plantations insurance and 131.5 million rubles. for animal insurance. The dynamics and trends in the amounts...
allocated by budgets at different levels correspond to the trends in the total amount for the areas and industries presented (Table 4).

According to the NSA, at the present stage in our country there is a real "shortage of subsidies," that is, the demand for insurance stably exceeds the amount of funds allocated for compensation of part of the costs of insuring agricultural risks, for 2012-2017 the deficit amounted to about 3.6 billion rubles [6].

To sum up, it should be noted that the amount of funds allocated for the development of agricultural insurance today does not allow this industry to reach the world level, since even the maximum volumes of subsidies were able to provide a low level of coverage with insurance protection, 17.1% in terms of sown area in 2014 and 22.4% in terms of livestock in 2019. To develop agricultural insurance in the future, it is necessary to increase the volume of subsidies to this industry and improve the mechanism of agricultural risk insurance (Table 2, 3, 4).

**Table 4.** Subsidies for compensation of part of the costs under agricultural insurance contracts with state support, 2014-2019, million rubles.

| Indicator name | 2014   | 2015   | 2016   | 2017   | 2018   | 2019   | 2019 к 2018 г., % |
|----------------|--------|--------|--------|--------|--------|--------|------------------|
| Subsidies for the compensation of part of the costs of agricultural insurance contracts with state support, total including: 1. under crop and multi-year insurance contracts at the expense of the consolidated budget of them: 1.1. subsidies from the federal budget | 6426.3 | 4683.7 | 2781.5 | 1174.2 | 1051.2 | 2040.9 | 194.1 |
| | 6033.1 | 4278.7 | 2515.1 | 756.7  | 523.3  | 1390.6 | 265.7 |
| | 4892.0 | 3877.6 | 2342.5 | 693.0  | 422.8  | 1122.6 | 265.5 |
| 1.2. subsidies from the budgets of the constituent entities of the Russian Federation | 1141.1 | 401.1  | 172.6  | 63.7   | 100.5  | 268.0  | 266.7 |
| 2. under agricultural animal insurance contracts at the expense of the consolidated budget of these: 2.1. subsidies from the federal budget | 393.2  | 405.0  | 266.4  | 417.5  | 527.9  | 650.3  | 123.2 |
| | 291.3  | 362.3  | 237.1  | 354.9  | 416.6  | 518.7  | 124.5 |
| 2.2. subsidies from the budgets of the constituent entities of the Russian Federation | 101.9  | 42.7   | 29.3   | 62.6   | 111.2  | 131.5  | 118.3 |
The modern agricultural insurance market in Russia is at the stage of recovery, after the negative impact of the introduction of a "single subsidy." Measures taken by state authorities in recent years in terms of the development of this industry have borne fruit and in 2019 positive trends in the development of this sector have emerged. The volume of insurance premiums collected doubled, the level of insurance coverage increased and the possibilities of agricultural risk insurance programs with state support significantly expanded, but despite this, the level of insurance promotion in the realities of agricultural production remains quite low.

The development of the insurance industry is also due to the high influence of natural factors on the results of agricultural production. In 2018 according to NSA the damage from the emergency situations (ES) in the sphere of agrarian and industrial complex was 13.7 billion rubles, 25 territorial subjects of the Russian Federation declared emergency in the region, for overcoming their consequences from the federal budget in 2019 6.8 billion rubles were allocated that covered less than 50% of damage. For the next three years (2020-2022), 2.5 billion rubles are planned in the budget for these purposes. This suggests that insurance in Russia at the present stage is not able to fully compensate for the losses of agricultural producers at the onset of emergencies and the state has to allocate additional funds to support this industry (Figure 4) [17].

Based on global experience and analysis of economic indicators of the development of the agricultural insurance market, we see that one of the main reasons for the low level of insurance protection in the agro-industrial complex is the lack of financing for this industry. According to the NSA, the leading countries of the world in terms of coverage by insurance protection of agricultural production per hectare are spent from 40 to 50 Euros, in our country this amount does not exceed 8 Euros/hectare. This indicates the need to further develop and improve the mechanism of insurance of agricultural production and its state support [5].

For this purpose, we have identified the main directions for improving the system of state support for insurance of agricultural production at the present stage:
1. Priority in the development of agricultural production insurance, in our opinion, should be given to the crop industry, since it is more affected by negative factors of a natural nature.
2. A stable regulatory framework is needed that has allowed the industry to develop over the years and not adapt to the conditions of constantly changing laws.

3. It is necessary to expand the list of agricultural risk insurance programs with state support so that they meet the requirements and capabilities of not only large agricultural producers, but also small farms.

4. Develop and put into practice insurance with state support for index insurance programs, which, based on international experience, are significantly more affordable than classical insurance.

5. To strive in stages, to increase the volume of state support for agricultural insurance to the average international level in order to increase the coverage of sown area insurance to 50%.

6. Develop an effective scale of insurance rates that allow you to fully meet the requirements for insurance payments and at the same time ensure the availability of the proposed insurance products.

7. Provide insurers with the opportunity to develop and implement new insurance products that meet the modern requirements of the insurer and the insurance services market in the practice of agricultural risk insurance with state support.

The proposed directions for the development of the system of state support for agricultural insurance will increase the volume of coverage with insurance protection of agricultural industries and will contribute to the growing interest of small forms of business in issues of insurance protection of their risks.

4. Conclusions

The work examined the international experience of agricultural risk insurance and identified the features of insurance operations and state support for agricultural insurance. It was determined that the experience of other countries can be adapted in the conditions of the insurance market of the Russian Federation and applied as a way of improving and developing the insurance mechanism in our country.

Further, the peculiarities of state support for this industry in our country were studied and an analysis of the economic state of the agricultural insurance market in Russia at the present stage was carried out. The main indicator of market development is the share of insured sown areas and livestock of farm animals. The dynamics of these indicators over the past six years has shown that the level of agricultural insurance protection in our country is at a low level, despite the fact that in 2019 there was a positive trend to the world average indicators is still very far away. Particular attention was paid to indicators characterizing the volume of subsidies for this industry. As a result of research, it was determined that the agricultural risk insurance system lacks budget funds, and its development directly depends on the amount of funding. It should also be noted that large agricultural producers are mostly involved in the insurance process, and for small-scale farming, the proposed insurance products are mostly inaccessible due to the high cost.

In conclusion, after a detailed analysis of the problems of this industry, we identified a set of areas for improving the system of state support for agricultural insurance.

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