

State policy of the Russian Federation in the field of seed production

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Abstract. The aim of the study presented in the article is to examine the governmental policy of the Russian Federation in the sphere of seed cultivation. The attainment of this objective is the direct outcome of an in-depth exploration into the seed market landscape, alongside an extensive review of regulatory frameworks and programmatic directives governing seed production within the Russian Federation. Throughout the investigative process, the scholars meticulously applied analytical and synthetic methodologies, complemented by systemic and structural-functional techniques inherent in scientific research. Furthermore, the study incorporated the interpretation of legal statutes and adept utilization of logical reasoning as integral components of the methodological framework. According to the findings from an investigation into the governmental policy concerning seed production in Russia presently, the researchers have deduced that there is a need to broaden the state mechanisms aimed at fostering the growth of the native seed market. It is proposed to create special mechanisms to support business entities that are engaged in the direct production (cultivation) of seeds of agricultural plants, including various economic incentive measures. The scholars also determined that enhancing governmental efforts to improve seed production through the integration of strategies aimed at bolstering the beekeeping industry, as well as implementing measures centered on the conservation of biodiversity and the protection of plant pollinators, is of utmost importance.

1 Introduction

Under current circumstances, agribusiness as a whole and specifically crop production represent key areas of focus for state regulation and support. [1], [2], [3]. The seed industry plays an important role in ensuring the food security of the Russian Federation. Providing high-quality seed material of domestic production in the current conditions of sanctions against our country is of strategic importance for providing the population with food.

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At present, the predominant reliance on imported seed material in Russia exerts a significantly adverse impact on the country's food security [4], [5], [6]. The Federal Scientific and Technical Program for Agriculture Development for the 2017-2030 period, approved by the Decree of the Russian Federation Government No. 996 dated 08/25/2017 (as of 30.09.2023), underscores the imperative of achieving a minimum of 75 percent domestic seed share for primary agricultural crops by 2031, aligning with the state policy of import substitution. This strategic objective entails specific targets to be met by 2031, including 50 percent for potatoes, 50 percent for sugar beets, 91 percent for grain crops, 75 percent for oilseeds, and 77 percent for corn.

The successful attainment of these targets to increase the proportion of locally bred seeds is pivotal in upholding the core principles of the Russian Federation's Food Security Doctrine outlined in Presidential Decree No. 20, dated 01/21/2020. This includes the overarching goal of achieving self-sufficiency at the national level in vital categories of domestic agricultural products, raw materials, and food items. However, surmounting the challenge of reaching the set threshold for the percentage of locally originated seeds for key agricultural crops will be indeed formidable.

To tackle the challenges regarding seed industry advancement, it is imperative to formulate and execute an appropriate governmental policy concerning seed production. This policy must offer assistance to entities and individuals involved in entrepreneurial activities within the seed production sector, encompassing the integration of innovations [7], [8], [9] and also foster the progress of associated sectors, such as beekeeping.

2 Methodology

The study utilizes a combination of conventional scientific and specialized research methods typically utilized by scholars to explore economic and legal aspects. The investigators employed various methodologies including analysis and synthesis, systemic and structural-functional analysis, normative-logical reasoning, and technical-legal approaches. The utilization of systemic structural and functional methodologies served as the foundation for scrutinizing the seed market. Normative-logical and technical-legal methods were utilized to assess the legal framework underpinning the governmental policies in Russia concerning seed production.

3 Results and Discussion

Currently, a significant amount of agricultural land in the Russian Federation is occupied for crops of various purposes. The data presented in Figure 1 illustrates the parameters reflecting the areas under cultivation of key agricultural crops within the territory of the Russian Federation.

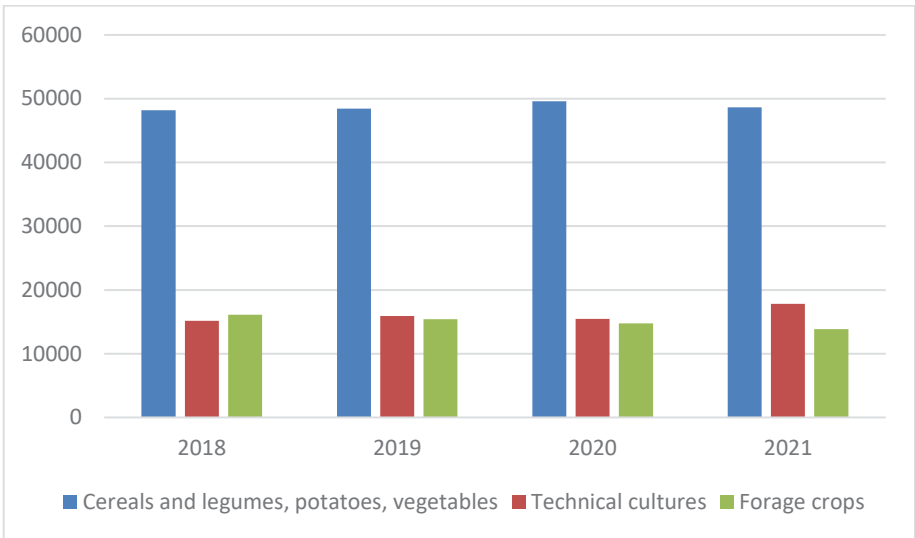


Fig. 1. Acreage of agricultural crops in the Russian Federation, thousands of hectares. Compiled by the authors according to Rosstat data - <https://view.officeapps.live.com/>

The examination of the data illustrated in Figure 1 indicates that the primary portion of agricultural territories is utilized for the cultivation of cereals, leguminous crops, potatoes, and vegetables, while industrial and forage crops cover a significantly lesser extent of agricultural land.

Thus, the main part of the crops grown is intended to provide the population with crop production. Therefore, the state must first of all provide these branches of agriculture with high-quality seed material of domestic production. At the same time, seeds of technical and fodder crops also require the creation of the necessary conditions for their production by domestic organizations.

In compliance with the regulations outlined in Federal Law No. 454-FZ dated 12/30/2021 (as amended on 08/04/2023) entitled "On Seed Production," seed production encompasses a spectrum of operations associated with the cultivation, storage, transportation, and commercialization of agricultural plant seeds, as well as the provision of related services, as specified by the All-Russian classifier of economic activities.

Both agricultural organizations and individual farms can engage in these types of activities. But they are under pressure from the world leaders in seed production [10].

There is currently a trend towards monopolization of the seed market in the global market. A significant share of the market belongs to large companies. According to experts, today the main share of the seed market is concentrated in the hands of the four largest global seed producers (Figure 2).

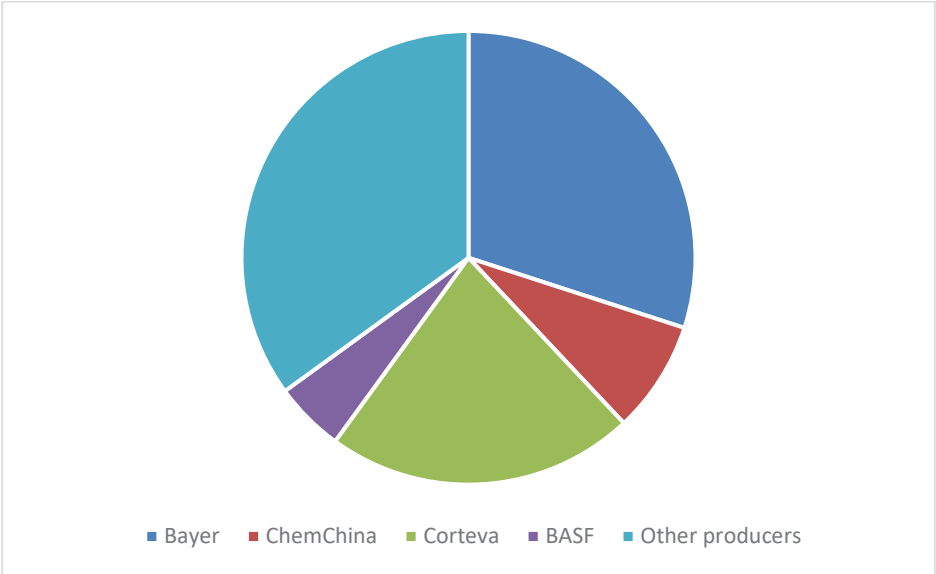


Fig. 2. Market share of the main seed producers, percent. Compiled according to Phil Howard, Associate Professor, Michigan State University <https://philhoward.net>

As we can see, more than 60 percent of the market belongs to monopolists united in multinational corporations: Bayer, ChemChina, Corteva, BASF. This is the result of the ongoing globalization and monopolization of the seed market over the past 40 years.

According to A.M. Malko, it is essential to discern the factors that fuel the continuous trends of globalization and monopolization:

- the increasing intricacy of breeding technologies necessitating substantial investments in research and manufacturing;
- a growing demand for enhanced resource movement across all components of a vertically integrated corporation;
- the push to enhance the accrual of selection royalties for the utilization of a particular variety;
- intensified competition linked with the process of globalization [11].

Experts assess the outcomes of such globalization through the lens of both positive and negative impacts. Notable advantages of this globalization include:

- expanded opportunities for funding innovative advancements in the domain of seed production;
- decrease in seed production costs resulting from increased output;
- enhancement of the quality of seed products[12].

Simultaneously, scholars emphasize that the monopolization of the seed market brings about adverse effects. This leads to various forms of misconduct on the part of monopolists, ultimately manifesting in:

- escalating seed material prices;
- depletion of national seed reserves;
- preferential promotion of more lucrative options for monopolists in the realm of patenting [12], [13].

We believe that for the Russian Federation, under the conditions of sanctions, the monopolization of the global seed market is a negative trend that requires the development of counteraction mechanisms.

The conclusion of transactions involving the sale of integrated technologies to agricultural producers, where seeds are included in the biotechnological process as an integral

element, leads to an unprecedented level of economic concentration in agriculture. This ensures the cultivation of plants resistant to a given complex of chemicals used in the cultivation of certain crops. This allows the main producers of high-yielding seeds to control the vast majority of the global seed market, as well as pesticides.

In the context of sanctions against Russia, such control by global seed monopolists inevitably leads to the vulnerability of the domestic agricultural sector. In this regard, it is extremely necessary to provide Russian agricultural producers with domestic seed material in order to implement the Doctrine of Food Security of Russia.

Section 27 of Federal Law No. 454-FZ, issued on December 30, 2021 (with amendments as of August 4, 2023), titled "On Seed Production," grants the authority to impose temporary restrictions on the import of agricultural crop seeds into the Russian Federation. Moreover, this provision allows for the establishment of additional specific criteria governing the varietal and sowing attributes of imported agricultural plant seeds within the Russian Federation. These regulatory measures are intended to provide indirect support to domestic seed producers.

For the development of seed production, it is important to create measures of targeted state support for those organizations, individual entrepreneurs and peasant (farm) farms that carry out activities in the field of seed production.

At present, within the framework of the Federal Scientific and Technical Program for the Development of Agriculture for the period 2017-2030, authorized by Decree of the Government of the Russian Federation No. 996 issued on August 25, 2017 (effective as of September 30, 2023), diverse subprograms are currently underway with the primary goal of promoting the seed industry. The subprograms encompass the subsequent undertakings:

- the subprogram "Enhancement of potato breeding and seed production in the Russian Federation";
- the subprogram "Advancement of sugar beet breeding and seed production in the Russian Federation";
- the subprogram "Progress in oilseed breeding and seed production in the Russian Federation";
- the subprogram "Improvement of industrial crop breeding and seed production in the Russian Federation";
- the subprogram "Progress in grain crop breeding and seed production";
- the subprogram "Development of vegetable crop breeding and seed production";
- the subprogram "Enhancement of maize breeding and seed production."

These subprograms are primarily designed to provide funding for innovative developments in seed production and the creation of competitive new varieties of agricultural plants, which are essential for the advancement of domestic seed production. However, we believe that equally important mechanisms exist for fostering the growth of business entities engaged in the direct cultivation of agricultural plant seeds.

In the bygone Federal Law No. 149-FZ of 17.12.1997, known as "On Seed Production," which remained in force until September 1, 2023, Article 15 explicitly outlined governmental measures to support seed production. Conversely, the contemporary Federal Law No. 454-FZ of 30.12.2021, titled "On Seed Production," amended on 04.08.2023, no longer contains such provisions. Thus, there is a proposal under consideration to introduce new frameworks for state assistance to enterprises involved in the development of innovative plant varieties and the large-scale production of indigenous seed materials. Recognizing the critical importance of sustaining growth in this sector, it is deemed necessary to implement diverse forms of state support, including the provision of tax incentives, facilitating access to preferential loans, and exploring alternative economic mechanisms to promote expansion and reinforce the stability of the seed industry.

In addition, it is impossible to raise domestic seed production in such difficult competitive conditions to a level that ensures Russia's independence from foreign supplies without the active development of beekeeping. Bees and other pollinators are known to ensure the reproduction of plants. At the same time, the inclusion of self-pollinated varieties of various types of agricultural plants (sunflower, buckwheat and others) in the crop rotation inevitably leads to a decrease in plant viability. Only with cross-fertilization does continuous hybridization, splitting and recombination of genes occur, which leads to an increase in the fertility and power of plants grown from seeds obtained as a result of cross-pollination. However, modern crop production uses pesticides to control pests [14], which leads to the mass death of bees and other pollinators.

In this regard, it is necessary to support the position of N.G. Romanenko on the need to take into account the influence of beekeeping on the production of high-quality seed material [15]. One of the directions of the state development of domestic seed production should be support for the beekeeping industry and measures aimed at maintaining biodiversity and protecting plant pollinators.

4 Conclusion and Recommendations

Extensive territories across the Russian Federation are allocated to the cultivation of diverse crops, focusing primarily on cereals and legumes. The advancement of the agricultural industry crucially depends on the establishment of a resilient internal market for high-quality seeds.

A noticeable global tendency towards the monopolization of the seed market is observable, characterized by a substantial influx of seed imports into Russia. Given the existing sanctions pressure that the nation faces, this heavy reliance on imported seeds poses a potential threat to national food security. Therefore, it is essential to promote the development of domestic seed production capacities.

At present, the Russian government is implementing a program aimed at financing innovative endeavors in seed production, particularly emphasizing the creation of new native seed varieties. While this initiative represents a pivotal aspect of state strategies concerning seed production, a more proactive approach is warranted. Crafting tailored support mechanisms for enterprises directly engaged in seed cultivation is of paramount significance. State support in this realm should encompass a variety of economic incentives, including tax incentives and preferential lending terms.

Acknowledging the importance of beekeeping in ensuring the quality of seed material production is imperative. Consequently, the state's seed production development program should integrate provisions for enhancing the beekeeping sector, promoting biodiversity conservation, and safeguarding plant pollinators.

References

1. S. Makrak, A. Kliukin, D. Sinilo *Agrarian Economics*. (2023) **10**, 82-96.
<https://doi.org/10.29235/1818-9806-2023-10-82-96>
2. T. Skvortsova, G. Pratsko, and E. Marchenko *E3S Web of Conferences* **402**, 13018 (2023) <https://doi.org/10.1051/e3sconf/202340213018>
3. T. Shatkovskaya, T. Epifanova, N. Romanenko, V. Bulgakov. Innovative approach to legal regulation for using beekeeping data in forest areas, *IOP Conference Series: Earth and Environmental Science (Voronezh)* Vol. 595. International Forestry Forum "Forest Ecosystems as Global Resource of the Biosphere: Calls, Threats, Solutions", (2020). C. 012005.

4. G. Pratsko, T. Skvortsova, T. Epifanova and Ya. Kurinova National small agribusiness policy in EAEU countries, E3S Web of Conferences. Vol. **273**, 08042 (2021). INTERAGROMASH 2021. <https://doi.org/10.1051/e3sconf/202127308042>
5. T.A. Skvortsova, I.P. Denisova, N.G. Romanenko, A.V. Sukhovenko Innovations and Support for Quality in Agriculture: A Case Study, European Research Studies Journal, XXI, 1, 423-431 (2018)
6. T. Bogachev, T. Alekseychik N. Vovchenko, and Ya. Kurinova Modeling of Number of Small and Medium Enterprises in Rostov Region Using a Modified Model Fuzzy Time Series, ICSCCW 2021, R. A. Aliev et al. (Eds.). Springer Nature Switzerland AG 2022, LNNS 362, 474–479. https://doi.org/10.1007/978-3-030-92127-9_64
7. T. Skvortsova, G. Pratsko, Yu. Isakova and E. Marchenko (2023). State policy of Russia in the field of transition to an innovative economy in agribusiness. In: International Scientific Conference “Fundamental and Applied Scientific Research in the Development of Agriculture in the Far East” (AFE-2022). E3S Web Conf. Volume **371**, 2023 01072. DOI: <https://doi.org/10.1051/e3sconf/202337101072>.
8. V.I. Nechayev, T.G. Bondarenko, P.V. Mikhailushkin Once again on Improvement of Legislative support of Selection and Seed production in the Russian Federation, Economics of Agriculture of Russia (2020) 2, 55-64, DOI: 10.32651/202-56
9. T.V. Shatkovskaya, T.V. Epifanova, T.A. Mosienko, M.S. Shatkovskaya, E.V. Mikulina, and M.I. Bogdanova Artificial Intelligence Technology as a Complex Object of Intellectual Rights, Technological Trends in the AI Economy, Smart Innovation, Systems and Technologies: E.N. Makarenko et al. (eds.) Springer Nature Singapore Pte Ltd (2023) 625, https://doi.org/10.1007/978-981-19-7411-3_17
10. N. Zemlyakova Economic risks in the activity of agro-industrial complex enterprises in conditions of import substitution, E3S Web Conf., 371 (2023) 01060. DOI: <https://doi.org/10.1051/e3sconf/202337101060>
11. Malko A.M. The world seed market and Russia's place in it // <http://potatoveg.ru/glavnaya-tema/mirovoj-rynok-semyan-i-mesto-rossii-v-nem.html>
12. Analysis of the situation in the field of seed production. Regulation of this sphere in various countries of the world. October 2023 // RUSEED - <https://ruseed.ru/assets/files/analiz-situaczii-v-semenovodstve-.pdf?ysclid=lt92904ewy487405480>
13. Seeds of profit: global trends in the seed industry, part 1 // Senior Agronomist - <https://glavagronom.ru/articles/semena-pribyli-mirovyie-tendencii-semenovodcheskoy-otrasli-chast-1?ysclid=lt92lsszbr150508749>
14. N. Ergasheva, Sh. Makhmudova Types of soybean pests and measures against them. E3S Web Conf., 371 (2023) 01031 DOI: <https://doi.org/10.1051/e3sconf/202337101031>
15. Romanenko N.G. Legal regulation of relations in beekeeping. Monograph. Rostov-on-Don, 2022.