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VIR: from a small Bureau in the Russian Empire to the present-day National Center for Plant Genetic Resources

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Abstract: In 2024, the All-Russian Institute of Plant Genetic Resources (VIR), the world's oldest scientific institution dedicated to plant genetic resources (PGR), celebrates its 130th anniversary. Founded as the Bureau of Applied Botany in the late 19th century, VIR has evolved into a globally recognized institute, currently also known as the National Center for Plant Genetic Resources. It preserves a collection of more than 320,000 unique accessions from 64 botanical families, 376 genera and 2,169 species. The Institute's mission includes the systematic collection, comprehensive study, long-term conservation and sustainable utilization of PGR. The foundation for most of VIR's research endeavours was laid by Nikolay Vavilov, a prominent botanist, geneticist, plant breeder and scientist with an encyclopedic scope of knowledge. A key strength of the Institute has always been its extensive cooperation with global, regional and international organizations, as well as research institutes, universities and breeding centres in many countries around the world. Today, as the National Center for PGR, VIR continues to build on this legacy. Its efforts include the development of a legislative platform for genetic resources in Russia and fostering international scientific cooperation on PGR, continuing the vision of Nikolay Vavilov.
The purpose of this review is to show the milestones that marked the development of PGR studies and utilization in Russia as well as to highlight some of the Institute's achievements since several conceptual approaches to these issues remain highly relevant.

Keywords: Bureau of Applied Botany, VIR, Vavilov, collection, history, study, conservation, genetic resources, plants

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Introduction and historical events

The Bureau of Applied Botany was founded in 1894 in St. Petersburg under the auspices of the Scientific Committee of the Ministry of Agriculture and State Property, intended as an institution for collecting and studying the diversity of cultivated plants in the Russian Empire. All the measures towards its establishment were initiated and accomplished by Prof. A.F. Batalin and Prof. I.P. Borodin, who would both become the Bureau's first heads. The Bureau made significant progress starting in 1900 with the arrival of R.E. Regel, an expert in botany and agriculture. The most significant changes occurred in 1905, when Regel was elected as the new head of the Bureau (Loskutov, 1999).

The main concrete outcome of the Bureau's activities under Regel's leadership was the collection, identification and description of the varietal diversity of cultivated plants grown in the Russian Empire. Those efforts helped to restore the lost diversity of cereal crop varieties and populations – particularly malting barley – following the devastating droughts in the Volga region. The racial, varietal and specific composition of local cultivars and populations was documented for wheat, barley, oats, rye, some legumes, vegetable crops and others (Regel and Proceedings on Applied Botany and Breeding, 1915). The Bureau's plant studies resulted in identifying hereditary morphological and agronomic traits, performing successful crosses, and clarifying the genetic nature of some of those, following Gregor

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Mendel's principles of genetic analysis. Comprehensive research on plant collections data enabled the development of the Bureau's own original botanical classification systems for a number of priority crops, based on the studied morphological, anatomical, cytological, biochemical, immunological and agronomic plant characters (Regel and Proceedings on Applied Botany and Breeding, 1915). In 1906, the Bureau of Applied Botany received the highest award (Diploma d'Onore) at the World Exhibition in Milan (Esposizione Internazionale di Milano) for the presentation of the barley collection and the results of its study, later summarized by Regel in his publication Les orges cultivées de l'Empire Russe in French (Loskutov, 1999).

Regel laid the foundations for collecting missions, both within the Empire and beyond, to supply the collections with new accessions. In 1908, he launched the publication of Proceedings on Applied Botany, the first scientific journal dedicated to the use of botany in agricultural practice (Loskutov, 2009). In the following years, the exchange of publications gained significant momentum: by 1928, the Proceedings on Applied Botany were sent to 175 research institutions worldwide, while in exchange the local scientific library received publications from 136 foreign research centres. In 2023, the journal founded by Regel (currently named Proceedings on Applied Botany, Genetics and Breeding) celebrated its 115th anniversary. Today, the journal is indexed in the Web of Science, the Russian Science Citation Index (RSCI), Scopus, and DOAJ (Supplements, 2023).

When Regel unexpectedly passed away from typhus in 1920, a talented young researcher, Nikolay Ivanovich Vavilov, was elected in his place. His works on the immunity of cereal crops were highly valued by leading Russian scientists at that time.

From those days onward, the Bureau's activities expanded to a completely different scale: as early as 1924, it was raised to the status of an Institute (the All-Union Institute of Applied Botany and New Crops). Vavilov established a network of experiment stations across the USSR, where all the collected crop materials were studied under various environmental conditions (VIR's current experimental network consists of 15 branches in 12 regions of Russia, from the southernmost site in Dagestan to the Arctic). He organized collecting missions abroad, to all the world's continents, as well as to the remotest nooks over the vast territory of the USSR. Vavilov enhanced the international exchange of plant germplasm among leading plant breeders and botanists on a global scale. While collecting plant resources and studying them, he continued to work on his scientific theories and fundamental principles. Based on these research endeavours, he promoted plans for himself and his associates to conduct further plant explorations across the Soviet Union and in foreign countries. He developed a scientific framework to support the expansion of the cultivation area for individual crops and the introduction of new cultivars and plant species into the USSR territory. Unfortunately, those ambitious plans failed to come to life to their fullest (Loskutov, 2020).

In 1930, the Institute was renamed the All-Union Research Institute of Plant Industry, and during this time it adopted its world-famous acronym, 'VIR'. However, the new name did not fully encompass the Institute's principal activities and objectives. Looking ahead, it would be only at the end of 2014, when VIR gained the status of one of the first federal research centres in Russia, that the concept of 'plant genetic resources' (PGR) entered the Institute's official name (see a photo of VIR's headquarters in Figure 1).

The Great Patriotic War (World War II) of 1941–1945 was a dramatic period for the survival of the Institute's staff members and the safeguarding of its unique collections. With the outbreak of the war, even before the city was beleaguered by the Nazis, the government decided to evacuate a number of factories and institutes from Leningrad, including VIR. However, it was not until the winter of 1942 that the Institute started a partial evacuation of its employees and holdings, although the arrangements to prepare the move had been underway for a long time. Eventually, the largest and most important part of the collections was left in the besieged city. The remaining staff members had to toil under the harshest conditions of the siege, in unheated premises. The severe winter of 1941–1942 brought drastic reductions in the daily bread allowance, and the city faced starvation. Hundreds of thousands of people died from hunger, including VIR's employees, who kept seeds and tubers in the collections safe and intact. Only their heroic efforts saved the Institute's collection from destruction and loss of viability. Such heroism cost the lives of more than 20 scientists and specialists, but as irreparable as that cost might be, VIR managed to survive the most dangerous period in its existence. Suffering extreme physical exhaustion in frozen rooms, without water or electricity, under continuous shelling, the Institute's staff members secured the collection of cultivated plants and their wild relatives, the herbarium and the scientific library for future generations, often paying with their own lives (Loskutov, 2021).

The current situation

Vavilov paid special attention to the conservation of the genetic diversity of cultivated plants and their wild relatives, collected from all over the world, for future generations. The need for safe preservation was triggered by the concern that, over time, the valuable global collection could lose its qualities or genetic homogeneity due to frequent regenerations of its accessions, which were necessary to restore high germination rates. To minimize the frequency of regenerations while ensuring the seed viability of accessions, it became essential to maintain them under controlled conditions in specialized low-temperature storage facilities.

Figure 1. VIR's headquarters, St. Petersburg. Photo: VIR Archives

The geographic approach to plant germplasm conservation at the Institute's experimental stations has remained predominant since Vavilov's times. All accessions, mostly those from the larger cereal collections, have been distributed among the duplicate collections maintained at VIR's experimental stations for regeneration and conservation, following Vavilov's agroecological classification of crops (Vavilov, 1957). By combining long-term storage in the national genebank with short-term storage in working and duplicate collections at experimental stations and active collections at the Institute (Figure 2), VIR has ensured integrated and highly secure germplasm conservation. In addition, the Institute's collection management is based on a thoroughly developed (to the level of varieties) botanical classification of each genus and species. While managing the preserved biodiversity, much attention is paid to the passport data of each incoming accession, especially to the true geographic origin and its correct (original) name, which are important for the timely identification of duplicate accessions in the collection (Loskutov, 2009).

Storage facilities

Since 1946, VIR has been experimenting with the long-term storage of various crop accessions from its global collection under controlled conditions. The results of such experiments made it possible to find the optimal storage conditions for germplasm accessions, preserved as dried seed samples in hermetically sealed containers. Long-term and medium-term storage of seed samples at low temperatures is a safe and relatively inexpensive method for PGR conservation (Khoroshailov, 1978; Filipenko, 2007). PGR storage at low temperatures began at VIR in the mid-1950s with systems under various temperature conditions. In 1969, the storage facility was reconstructed and updated. Special premises were allocated in the Institute's headquarters for this purpose, where a temperature of +5/7°C was maintained, and where a significant part of the VIR collection was preserved until the late 1980s (Khoroshailov, 1978).

In 1976, the National Seed Store was built at the Kuban Experiment Station of the Institute (Krasnodar Territory) to house the VIR core collection under controlled conditions. The design of the National Seed Store, occupying the underground section of the building, allowed for the storage of seed samples in hermetically sealed glass containers at +4°C in 24 rooms without relative humidity control, with a total estimated capacity of 400,000 accessions. For a long time, the VIR collection was successfully stored in the National Seed Store. By the mid-1990s, about 70% of the accessions held within the base seed collection had been placed for storage in the Kuban Experiment Station facility. In 1994–1997, the international community (International Plant Genetic Resources Institute (IPGRI) and United States Department of Agriculture (USDA)) helped to renovate, including the sealing of underground floors, the building and equipment of the National Seed Store, so that constant and stable storage could be maintained there. This programme included the delivery of modern refrigeration equipment and computer hardware, the latter serving as the platform whereupon the electronic databases of the VIR collections were developed (Loskutov, 2009).

In 2008, the Kuban Seed Genebank (as the National Seed Store had been renamed), a branch of VIR, was supplied with new technological equipment and larger refrigeration chambers for PGR conservation, designed to perform effective operations at a higher scientific

Figure 2. Working collection at VIR, St. Petersburg. Photo: VIR Archives.

and methodological level. Today, the repositories of the Kuban Seed Genebank hold 336,396 storage seed samples of various crop seed samples, including about 17,000 accessions from other scientific institutions, at low positive (+4.5°C) and negative temperatures (–5.0°C and –20.0°C) in a ratio of 10 to 1.

Modern low-temperature storage facilities were installed in the VIR headquarters (St. Petersburg) in 2000, with support from the international community (IPGRI, USDA). The temperature regime of +4°C is maintained in two seed storage rooms (437m^3 in volume), and –10°C in three others (434m^3). The research conducted at the VIR genebank resulted in partial development and introduction of more advanced technologies (lamination, sealing) for long-term PGR conservation, which led to a significant decrease in labour costs and funding, required to maintain the collections in a viable state, reducing the need for periodic seed regeneration. Of late, significant efforts have been made to transfer seed accessions under controlled storage conditions. The seed material is now hermetically packed in laminated foil bags or glass containers in all types of storage.

As of early 2024, 438,951 seed accessions from the VIR PGR collection were stored in the Institute's low-temperature seed storage facilities in St. Petersburg. Information about these accessions is available in the database of stored materials: 308,481 accessions are placed under medium-term storage (–10°C), and 130,470 under long-term storage (–20°C) conditions (Table 1). At present, a total of over 750,000 storage units (including safety duplicates) with genetic resources accessions from the unique global collection of VIR are placed for safe conservation in one or the other type of temperature-controlled storage facilities within the Institute's genebank network (Loskutov, 2025).

In 2023, as part of the instrumentation upgrade programme under the National Project 'Science and Universities', VIR installed new updated seed storage facilities, with a temperature regime of –18°C and a capacity to store over 300,000 units.

Plant exploration

The revival of Vavilov's name and ideas in the second half of the 20th century catalyzed a thorough exploration of plant resources all over the globe. Not only Soviet and Russian researchers were credited with this endeavour, but also scientists and experts from many foreign countries (Zeven and Zhukovsky, 1975; Sazonova *et al*, 1994; Frankel *et al*, 1995; Harlan, 1995; Pistorius, 1997; Pistorius and Van Wijk, 1999; Loskutova and Ozerskaya, 2018, 2019, 2020, 2021; Solberg *et al*, 2023).

Table 1. Structure of preservation of the world collection of VIR, 2024. *, seed samples.

№	Type of storage	Place of storage	Number of accessions
1	*Ex situ*	VIR, St. Petersburg, working collection	290,000
2		Network of VIR stations, field genebank	30,000
3		VIR, St. Petersburg, medium-term storage	308,481*
4		VIR, St. Petersburg, long-term storage	130,470*
5		Kuban Seed Genebank, medium-term storage	290,692*
6		Kuban Seed Genebank, long-term storage	45,704
7	*In vitro*	St. Petersburg	1,134
8	Cryo	St. Petersburg	3,677

Besides, Vavilov's life and work, the activities of the Institute he led, and the importance of the VIR collections for the global community have been a subject of interest for Russian and foreign researchers (Rokityansky *et al*, 1999; Pringle, 2008; Nabhan, 2011; Cohen and Loskutov, 2016; Goncharov, 2017; Reznik, 2017, 2021; Loskutov *et al*, 2023).

The new knowledge obtained from contemporary plant explorations inspired the Institute's scientists to develop and expand Vavilov's concept of the centres of crop origin. The data accumulated through comprehensive research on the enormous diversity of crop species and their wild relatives helped to develop new botanical classifications or adjust the existing taxonomies for the most important crops, published in new volumes of the Cultivated Flora, a series of publications started by Vavilov. An in-depth study of intraspecies diversity made it possible to identify or artificially develop the plant forms predicted by Vavilov's law of homologous series in hereditary variation (Loskutov, 2025).

A crucial part of VIR's international activities in the 1960s–1980s was organizing and implementing the work on collecting, studying and conserving PGR within the framework of the Council for Mutual Economic Assistance (COMECON), which bound together the USSR, the socialist countries of Eastern Europe, and Mongolia. Their joint collecting missions and seed exchange efforts enlarged the genebank collections of such countries as Czechoslovakia (1.5 times), Hungary (by twofold), Bulgaria and East Germany (threefold), and Poland (sevenfold). In addition, the collections of Mongolia and Romania were also expanded (Alexanian, 2002).

After the dissolution of the USSR in 1991, independent PGR genebanks emerged in the former Soviet Republics. In some cases, national genebanks were established based on agricultural, plant breeding or botanical research institutes that had been closely cooperating with VIR for decades in various areas, including plant germplasm exchange, such as those in Estonia, Latvia, Lithuania, Moldova, Georgia, Armenia, Tajikistan and Kyrgyzstan. In other cases, national genebanks developed from collections previously maintained at experimental stations or base sites within the VIR network before 1991. These genebanks were established in Ukraine, Belarus, Azerbaijan, Uzbekistan, Kazakhstan and Turkmenistan (Loskutov, 2025).

Only in the past ten years, 110 collecting missions have explored the Russian Federation and foreign territories to monitor PGR *in situ* and enrich VIR's *ex situ* collections (State Research Centers, 2023).

Composition of the collections and research on PGR diversity

Thanks to the large-scale activities undertaken by Vavilov and his associates, VIR is now the holder of two unique biological collections:

- The VIR Collection, a global collection of genetic resources of cultivated plants and their wild relatives. It is one of the world's largest in terms of the botanical, genetic, geographic and ecological diversity, and includes samples from 64 botanical families, 376 genera and 2,169 species. In terms of crop groups, the collection is composed of cereals (137,500 samples), legumes (46,500), forage crops (32,000), vegetable and melon crops (52,000), industrial crops (28,500), tuber crops (8,300), fruit crops (23,000), totalling 327,800 samples. As of 1 November 2024, the volume of VIR's world collection amounted to more than 320,000 unique samples (Loskutov, 2025);
- The VIR Herbarium (acronym 'WIR'), a collection known as the Herbarium of Cultivated Plants of the World, Their Wild Relatives and Weeds of the N.I. Vavilov All-Russian Institute of Plant Genetic Resources. It is one of the world's richest herbaria, specializing in cultivated plants, with a status corresponding to a specialized herbarium of global significance. As of 1 November 2024, it includes 141,293 herbarium specimens and 379,292 herbarium sheets (Khlestkina *et al*, 2022).

Currently, VIR employs over 1,200 people, of which about 500 conduct research in St. Petersburg and over 700 work at experimental stations – the VIR branches. The Institute's structure includes several components. In St. Petersburg, the departments of genetic resources focus on collecting, studying in the field, propagating, preserving and distributing samples of the collection. Additionally, methodological departments and laboratories conduct in-depth research on the collection samples from the point of view of genetics, physiology, biochemistry and molecular biology. The structure of VIR also includes a genebank, represented by the Laboratory for Long-Term Storage of PGR, collective-use centres and a network consisting of 15 VIR experimental stations located in different parts of the Russian Federation. Every year, VIR distributes more than 5,000 collection samples free of charge to more than 200 requests from state research, breeding institutes and universities of the Russian Federation.

Vavilov's plans for genetic research into plant species diversity, which he was unable to fully realize during his lifetime, became one of the main priorities of the Institute. This mission formed the basis of a programme aimed at selecting and developing sources and donors for important agronomic traits. The resulting data underpinned the establishment of trait-specific and genetic collections with identified genes) (Merezhko, 1994; Mitrofanova, 1994; VIR, 2005; Porokhovinova *et al*, 2013). In the 2000s, modern methods of molecular biology started to be widely introduced for the in-depth study of the genetic diversity preserved in the VIR global collection (Anisimova *et al*, 2011; Antonova *et al*, 2011, 2016; Artemyeva *et al*, 2012, 2017; Zlotina *et al*, 2013; Burlyaeva, 2014; Gavrilenko *et al*, 2014; Teplyakova *et al*, 2017; Novakazi *et al*, 2019; Sallam *et al*, 2021). Today, the Institute is engaged in extensive genomic and postgenomic research activities, including those within the framework of projects under the auspices of the Federal Scientific and Technical Program for the Development of Genetic Technologies for 2019–2030, and the National Project 'Science and Universities', targeted at different crop groups: cereals (Antonova *et al*, 2022; Porotnikov *et al*, 2022; Khlestkina *et al*, 2022; Chikida *et al*, 2023; Gnutikov *et al*, 2023; Loskutov *et al*, 2023; Rozanova *et al*, 2023; Semilet *et al*, 2023; Lukina *et al*, 2024; Shvachko *et al*, 2024), grain legumes (Krylova *et al*, 2023, 2024a,b), oilseeds and industrial crops (Mikhailova *et al*, 2024, 2022; Anisimova *et al*, 2023), vegetables (Strygina and Khlestkina, 2022; Berensen *et al*, 2023; Fateev *et al*, 2023), forage crops (Malysheva *et al*, 2023), fruit crops (Kamnev *et al*, 2023; Razgonova *et al*, 2023a,b), potato (Antonova *et al*, 2020; Fomina *et al*, 2020; Rybakov *et al*, 2020; Gavrilenko *et al*, 2023; Gurina *et al*, 2022), and many others.

Following the implementation of those programmes and projects, new knowledge was obtained in the field of plant genetics, physiology, biochemistry and taxonomy, including the identification, mapping and/or labelling of more than 100 target genes and loci of quantitative traits. Only from 2018 to 2022, VIR's scientists identified 8,566 sources of important agronomic traits and identified 32 donors of valuable genes. Twelve edited lines of various crops have been released and are being studied using genetic technologies under VIR's projects jointly with the Institute's partners.

Sustainable use of PGR

From 2007 to 2023, based on the assessment of more than 100,000 accessions of cereals, grain legumes, oilseeds, fruit and berry, and vegetable crops for the most important economically valuable and biochemical quality traits, more than 6,700 sources for various breeding areas were identified. More than 26,000 accessions of various crops were studied for resistance to diseases and pests against harsh infectious backgrounds. More than 970 sources of high resistance were identified. The effectiveness of resistance sources of various crops to populations of harmful organisms was also studied – causative agents of leaf rust, dark brown leaf spot and Fusarium head blight in wheat, barley and oats; net spot, loose and stone smut in barley; coccomycosis in cherry; common cereal aphid in sorghum. More than 5,250 accessions of the gene pool of cultivated plants were screened for resistance to abiotic environmental factors, and more than 500 sources of valuable physiological traits were identified (weak photoperiod response and early maturity, tolerance to excess mobile aluminium, cold and drought resistance). Over the past 5 years (2019–2023), VIR identified 6,820 sources of economically valuable traits and created 19 donors of valuable genes, which were sent to the leading breeding centres of the Russian Federation. Since 2013, VIR has registered almost 130 patents (varieties and technologies for implementation in production in the agro-industrial complex). All selected and created genetic sources and donors were sent to leading breeding institutions of the Russian Federation.

During the same period, over 300 new varieties of major agricultural crops were created and approved for use in agricultural production of the Russian Federation based on VIR sources and donors in breeding centres and research institutes. VIR employees created 98 varieties of economically significant crops included in the State Register of Breeding Achievements of the Russian Federation, and received 47 patents and 102 author's certificates for varieties.

Implementation of modern technologies

In 2004, the genebank of VIR was equipped with cryogenic systems (Figure 3), and the Institute was able to start cryopreservation activities. Presently, pollen samples and cuttings of fruit and berry crops are preserved in liquid nitrogen vapours, and cuttings are also placed under liquid nitrogen (Filipenko, 2007).

Currently, biotech and digital approaches are widely applied at VIR to develop methodologies for maintaining *ex situ* PGR collections, including their conservation and two- or three-fold safety duplications under controlled conditions (short-, medium- and long-term storage of seed accessions in specialized low-temperature facilities, cryopreservation, and *in vitro* conservation of vegetatively propagated crop samples), safe maintenance of perennial crop accessions in the field, regeneration of accessions to ensure seed

Figure 3. Storage facilities, cryopreservation, St. Petersburg. Photo: VIR Archives.

germination and obtain fresh material (Figure 4), etc. (Khlestkina *et al*, 2022).

By now, VIR has used biotechnologies to maintain 1,134 accessions *in vitro*, including 1,081 accessions of vegetatively propagated temperate-climate crops (656 potato, 21 onions, 348 berry and fruit plants, and 53 ornamentals), as well as 2,045 pollen samples, 1,184 cuttings of various fruit plants and grapes, and 448 samples of apical meristems (415 of potato, and 33 of raspberry) for a total of 3,677 accessions under cryopreservation (Table 1).

The methods developed at the Institute to preserve and evaluate PGR are published in the format of guidelines (Filipenko, 2007; Loskutov *et al*, 2012).

International events

VIR has organized more than ten major international events in recent years, including the International Wheat Conference in 2010, the International Oat Conference in 2016, regular International Vavilov Conferences (the last one in 2022; Khlestkina *et al* (2022)) held every five years, and major international conferences dedicated to the Institute's birthday, the last of which was successfully held in November 2024. Besides, VIR was the initiator and co-organizer of two major fora 'Genetic Resources of Russia', bringing together the holders of biological collections of all specializations (Tikhonovich *et al*, 2022, 2023). Partly owing to this initiative and following broad multidisciplinary discussions at those forums, the National Law on Bioresource Centers and Biological Collections was drafted in Russia (Tikhonovich *et al*, 2024).

Sustainable future and an intensified research programme

Over the past five years, the Institute has significantly intensified comprehensive research on the VIR collection through the implementation of large-scale research programmes, including collaboration with partner institutions participating in programmes coordinated by VIR, as well as through VIR's active involvement in consortia. Examples of such partnerships are the 'National Network Collection of Plant Genetic Resources for Effective Scientific and Technological Development of the Russian Federation in the Field of Genetic Technologies', and 'Breads of Russia', supported in the framework of the Federal Scientific and Technical Program for the Development of Genetic Technologies for 2019–2030. An example of participation in a consortium is the programme of the World-Class Scientific Center, 'Agrotechnologies for the Future'.

In 2022, two Decrees were issued by the President of the Russian Federation. The first founded the National Center for Plant Genetic Resources based on VIR, while the second established the Interdepartmental Commission on the Formation, Preservation and Use of Plant Genetic Resources Collections (Khlestkina *et al*, 2022). In 2023, the Government of the Russian Federation approved the Program for the Development of the National Center for Plant Genetic Resources for 2023–2030. This programme provides conducive conditions for the development of scientific, research and development activities in the field of PGR to ensure scientific and technological development of the Russian Federation, finding integrated solutions to the questions

Figure 4. Regeneration field, harvest time, Pushkin, St. Petersburg. Photo: VIR Archives.

associated with the accelerated progress of genetic technologies.

The Law On Bioresource Centers and Biological (Bioresource) Collections was adopted by the State Duma of the Russian Federation on 26 November 2024, and on 30 November 2024, Russian President Vladimir Putin signed the Federal Law.

Within the framework of the Program for the Development of the National Center for Plant Genetic Resources, annual collecting missions are planned to be conducted abroad from 2024 to 2030. The first mission was carried out in 2024, jointly with the National Research Institute of Plant Genetic Resources of the Republic of Uzbekistan.

In 2023, VIR signed an agreement on scientific cooperation with the National Council of Humanities, Sciences, and Technologies (CONAHCYT) of the United Mexican States; among other objectives of the agreement, a joint collecting mission is planned to be organized in Mexico.

VIR is open to discussions on undertaking important international collecting missions together with other countries within the framework of planning for the period up to 2030.

The VIR World Collection, which began as the Russian Collection of Cultivated Plants, has grown into one of the most systematically collected, comprehensively studied and representative collections of PGR in the world. At present, the activities of VIR as the National Center for Plant Genetic Resources, and the development of the legislative system on genetic resources in Russia will be conducive to fostering effective international scientific cooperation in the field of PGR, thus keeping Vavilov's legacy alive. The National Center will provide effective solutions to new challenges in the systematic collection, comprehensive study, reliable preservation and sustainable use of PGR in the Russian Federation at a new level.

Authors contributions

Conceptualization, I.G.L., Yu.V.U. and E.K. Kh.; writing—original draft preparation, I.G.L., Yu.V.U. and E.K. Kh; writing—review and editing, I.G.L., Yu.V.U. and E.K. Kh. All authors have read and agreed to the published version of the manuscript.

Conflict of interest statement

The authors declare no conflict of interest

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