

The Professor A.G.Genkel Botanical Gardens

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In 1922, upon the initiative and under supervision of professor A.G.Genkel, the Botanical Gardens were founded at Perm State University . Such famous botanists as D.A.Sabinin, V.I.Baranov, E.G.Pavsky worked here, and their research greatly contributed to the development of biological sciences in the Urals.

At present the professor A.G.Genkel Botanical Gardens are the member of the regional Botanical Gardens Council of the Urals and the Povolzhye Area. It has a status of a scientific establishment and a protected natural territory. The principal directions of research are: introduction and acclimatization of plants, nurturing and selection of new forms and sorts most resistant and productive in local conditions.

The Botanical Gardens are situated on to allotments covering a total of 27 hectares. The collections include about 6200 species, forms and sorts of arboreal, brush and herbaceous plants growing in open and covered soil. Out of the hothouse plants, tropical and subtropical species are most widely represented. The Botanical Gardens are included in the international system of collection material exchange and publishes lists of seeds offered for exchange.

Today, Botanical Gardens are an important center of education, scientific and cultural activity in Perm and Perm Region. Students of Biology Faculty have their study and production practices here, collect material for writing term papers and dissertations. The Gardens' collections are used in lectures and laboratory work in biological and ecological subjects. General and thematic tours are offered for general population around the outdoor and indoor exhibits, plant exhibitions are organized.

Perm State University Botanical Gardens offers as part of exchange a list of seeds and spores to botanical gardens for use of the offered plant material for scientific and educational purposes as well as conservation of germ plasma and preserving biological diversity in general.

Historical Sketch

Creation of Perm State University Botanical Gardens was connected with two names known to every citizen of Perm. These are a major industrialist, honorary freeman of Perm, patron of art N.V.Meshkov and an outstanding scholar, doctor of botany, professor A.G.Genkel.

A prosperous capitalist, steamship fleet owner N.V.Meshkov was known among his contemporaries for his progressive mindset and enormous charity work. Being the owner of several large land lot situated within the city territory, he build charity establishments in honor of his mother E.I.Meshkova. One of them, a shelter ward, built at Zaimka, near a railway station, he handed over to the city. It was this accommodation that became the main building of the Perm Branch of the Emperor's Petrograd University founded in the same year, which was to become Perm State University. In front of the ward, N.V.Meshkov had been planning to plant a big People's Garden, which was to "serve the citizens of Perm as a pleasant place for walks and recreation in the open air". (Meyer, 1916).

To design the garden, in 1915, N.V.Meshkov invited from Moscow a then-famous landscape architect E.A.Meyer. One may still see his “Project of Establishing People’s Garden at the Meshkova Ward” (Meyer, 1916). According to the project, the garden was to cover the area of about 3 desyatinas (i.e . 3.3 hectares). The plan meant to have to it enclosed it with a grid, make sidewalks along the roads adjacent to the garden and plant trees, mainly limes, along those. The main adornment of the gardens was to be regularly shaped lawns. A big pool was to be made at the entrance of the garden. This front part of the garden was designed in the classical style, and the largest part of the garden area — in the landscape style employing the circular sectoral model. In E.A.Meyer’s opinion, the natural style was preferable, because it “is a complete contrast to the street network and at the same time matches the style of the main building” (Meyer, 1916). In the corners of the garden playgrounds were to be made, in the east part — a stony area for growing perennial Alpine plants, and behind the ward — a hothouse, the gardener’s house and a kitchen garden.

E.A.Meyer gives representatives of the local flora the central place among the plants recommended for People’s Garden. Out of the 104 proposed species of decorative arboreal and brush plants, 57 species grew on the territory of Perm province. All of them were divided into groups based on the color of bark, flowers, leaves, times of blooming and their fruits’ decorativeness. Apart from that, recommendations were given in regard to growing over 70 species of winter-resistant herbal perennials in the climatic conditions of Perm, which were also divided into groups based on their height and times of blooming. All plants in the garden were to be marked with labels giving the botanical names of the plants in Latin and Russian. At the end of the project, E.A.Meyer gives a detailed budget of work, which was without auxiliary construction buildings was 14 thousand rubles, based on the 1916 rates.

Unfortunately, this grand project was not realized due to well-known reasons. The revolution and the subsequent civil war postponed the plans for creating the garden until 6 years later.

E.A.Meyer’s project of People’s Garden is an interesting introduction generalization. With reference to famous Perm botanists P.Syuzuyov and P.Krylov, the author analyzed the possibilities for growing plants not typical for Perm and those the northern border of whose habitat lies here. For example, this is true for a special kind of the oak, etc. .At that , the project gives the fundamentals of the theory of introduction (unknown then) in a succinct and compact form. For example, the comparative method of climatic analogs is put imaginatively. E.Meyer writes: “... here we can only plant those sorts, which come from areas of a climate similar to that of Perm or harsher. The origin of the seeds plays the most important role in acclimatization experiments. The seed of the plant to be easier acclimatized is to come from the area of natural growing, which climate is the most similar to the one in question.”

Out of arboreal and brush plants unknown in Perm at the time, E.Meyer suggests growing, for example, the ordinary barberry, the ordinary cotoneaster ,the nigrescen broom, the Ginnala maple, the Daurian five-finger, etc.

In 1920-1921, the years of starvation, a part of the area of the future garden was used by the University faculty and staff as a kitchen garden. And only in 1922, upon the initiative of Head of Department of Plant Morphology and Taxonomy, Doctor of Botany, Professor A.G.Genkel, work was begun to create the botanical gardens of Perm University.

According to A.G.Genkel’s design, the collection of live plant was created primarily for teaching botanical subjects at the Department of Plant Morphology and Taxonomy. And, apart from that, they were to become a base for carrying out scientific research, done by the Departments of Plant Morphology and Taxonomy, Plant Physiology, Pharmacology, Pharmacognosy.

A vacant lot of 2 hectares was given for the Botanical Gardens. It was situated in front of the main university building. Its south-east edge was defined by the railroad. The territory of the future gardens was a lot, 2/3 of which was swamps and marshes, and the remaining third was sands. In addition, the whole area was covered in construction debris and raw tanning materials from the nearby tannery.

Under A.G.Genkel's direct supervision, dendrology breeding ground was founded, as well as collection lots and dendrarium. The collection of wild plants and those cultivated in the gardens was organized. As a result, the first Seeds Index was published in 1923, offered for exchange by the Botanical Gardens of Perm University. At the same time, the hothouses were erected by Y.Y.Girshfeld, the first gardener-technician. The Botanical Gardens' hotbed was situated in the attic of a university building. In January 1927, Perm University suffered great losses because of a fire. The attic of the hothouse building burned. The director of Botanical Gardens, Professor A.G.Genkel, was taking part in trying to extinguish the fire saving property and plants. The cold caught in this two-day effort (the temperature was 30 degrees below zero), provoked an acute attack of his old disease: lungs tuberculosis. On April 9, at the age of 54, A.G.Genkel died.

On the day of the funeral, the coffin with the professor's dead body was placed in the silent University botany room bestrewn with flowers. On the wall there was a map of the Botanical Gardens with a title that read "The best memorial for professor Genkel is Botanical Gardens". From then on, the university Botanical Gardens bear the name of their founder.

A part of the funds received by the university to restore the attic destroyed by the fire was given to the gardens for building a new hothouse, which is still in use by the Botanical Gardens. Besides, Perm Province Council allocated 20 thousand rubles to layout and to decorate the Gardens' territory. The directors (who succeeded one another) were D.A.Sabinin and V.I.Baranov. Owing to their efforts, in 1928 the city government made a decision to extend the territory of the Botanical Gardens through adding a vacant lot of 2.75 hectares on the other side of Genkel Street, between the second and the third lines of Zaimka. As a result, by 1930 the territory occupied by the Botanical Gardens grew up to 4.75 hectares.

From 1930 to 1941, E.A.Pavsky was managing the gardens. His appointment marked a significant increase in research and practical improvement in Botanical Gardens. The main line of research at the gardens of this period is connected with developing the range of fruit of berries that can be grown in the northern regions of the country.

From 1934, the organization of a laboratory at the Botanical Gardens was started. A library and a museum were opened, which introduced visitors to the cultures and crops of the gardens. The gardens' employees held many consultations on issues of fruit growing and gardening. The gardens were supplying schools, kindergartens, collected farms (kolkhozes, sovkhozes) of the Ural with seeds and planting materials. For example, in the 6 years from 1931 to 1936, 8 thousand planting materials of fruit and decorative materials were grown and given out or sold. The educational activity of the gardens was also intensive. 5 thousand people visited the gardens on tour from 1931 to 1935.

At the beginning of the 1930s, serious reclamation work was conducted on the Gardens territory, which allowed a lot of design work to be done for permanent planting.

During E.A.Pavsky's directorship the gardens' collections were increased significantly. In 1936, the dendrology collection possessed 105 species. The collection of technical, medical and decorative perennial herbal plants was represented by 65 species. The hothouse collection for study purposes consisted of 164 special, fruit and berries cultures collection included 65 species (sorts). Unfortunately, a vast part of these collections was lost.

A new period of the Botanical Gardens' development started in 1966, when V.S.Nikolayevsky and V.M.Yatsenko started working there. Large-scale research in the area of gas resistant plants was launched. Upon the initiative and under supervision of V.S.Nikolayevsky, a laboratory was created, which was named "Experimental Ecology and Plant Acclimatization". The research was carried out at chemical enterprises in Perm, Moscow, Tula regions and the Bashkortostan Republic. The goal of the research is to select, species, forms and sorts of arboreal and brush, flower and decorative and lawn plants resistant to toxic emissions. At the same time agricultural methods of growing plants in extreme conditions of growth and development were developed. Experiments in studying the mechanism of influence of certain toxic gases on biochemical and physiological processes in plants were conducted in laboratory, as well as experiments in determining the limit concentrations of toxic gases for plants.

The main results of work were published in three scientific digest magazines under the title “Gas Resistance in Plants” that came out in 1969, 1971 and 1975, and generalized in the PhD theses of V.S.Nikolayevsky (“doktorskaya dissertatsiya”), V.M.Yatsenko and V.B.Martsenyuk (“kandidatskaya dissertatsiya”). V.V.Frigger, V.V.Suslova, O.N.Oktyabrsky, L.M.Belokrylova, A.T.Miroshnikova, T.N.Kuznetsova greatly contributed to the development of new research at the gardens in this period.

After V.S.Nikolayevsky’s departure from Perm in 1967, V.M.Yatsenko became the head of the laboratory and Botanical Gardens. The laboratory of experimental ecology and plant acclimatization functioned until 1985, when it was closed. The staff of highly qualified scientists was dismissed, which negatively influenced the level of further scientific research.

At the end of the 1960s, upon request of the university chancellor, Perm Regional Party Committee made a decision to add more buildings to the university, which was fatal for the Botanical Gardens.

The construction of chemistry and geology buildings and dormitory was planned to be done on the territory of Botanical Gardens. As a result, half of the Botanical Gardens area with the collections and breeding nurseries was irretrievably lost. Unfortunately, the protests and demands of the gardens’ management remained unheeded.

Instead of the area intended for building in 1969, for the Botanical Gardens the city government gave a lot of 25.03 hectares near Goliy Mys settlement. The reclamation of the new territory was planned to be done at the same time with building construction at the old place. The plan of the territory development was designed and the reclamation began. At the beginning of the 1970, 2 panel cottages were built, 3 ponds were dug, 5 wells with deep-well pumps were drilled. However, soon it became known that the university is unable to create the necessary infrastructure of the gardens.

The staff of the Botanical Gardens, Biology Faculty and the Institute of Natural Sciences did not stop work of transferring the collections. The gardens’ scientific supervisor, V.M.Yatsenko, at the beginning of the 1970s designed a plan of placing arboreal and brush plants. About 100 species were planted in permanent places. 4 paths were founded, as well as collections of fodder crops, alfalfa and medical plants (over 100 species in all). A peonies production lot was created, a collection of lilacs was planted. Scientific and research work in fishing was carried out at the ponds. All work was done on the laboratory funds and partly those of the university.

Due to the lack of funding, the new territory reclamation work was stopped at the end of the 1980s. However, the encroachments upon the Botanical Gardens’ territory situated on campus did not cease with more building construction. Soon another 0.4 hectares were cut off and given for building a storage house for chemicals and “Mayak” Construction Bureau, and a pipeline was built in the middle part of the gardens.

In 1988 the management of the gardens obtained the documents certifying that decision No.35 of 17.02.1989 of Perm Regional Party Committee granted Genkel State Botanical Gardens the status of a natural memorial of regional significance.

In 1988 the building of an experimental laboratory and a hothouse of the total area of 1400 m² was begun. However, due to lack of funding it was soon stopped. In June 1991, a session of the Botanical Gardens Council of the Urals and Povolzhye was held in the university’s Botanical Gardens. Representatives of 8 botanical gardens and dendrariums of the region took part in it. A decision was made at the session to include the position of a scientific supervisor on the staff list. This request was granted, and Professor E.I.Demyanova, PhD, Department of Plant Morphology and Taxonomy was appointed scientific supervisor, under whose guidance a science and research group was formed out of the leading faculty of the department.

In December 1993, upon request of the Chairman of the Botanical Gardens Council of the Urals and Povolzhye S.A.Mamayev and Botanical Gardens Council of Russia L.N.Andreyev, the Botanical Gardens were granted the status of scientific institution and 3 scientific positions were added, subsequently lost. Besides, the topic of research “Introduction and Biology of Seed Reproduction of

Decorative Arboreal, Brush and Herbal Plants” was defined and approved, which now constitutes the main line of research.

Today, Botanical Gardens of Perm State University is a major scientific, education and cultural center of the Western Urals. Renowned for its traditions, Botanical Gardens possesses rich collections of wild and decorative flora. The most interesting collection is that of the hothouse, which includes over 2000 types of plants. The gem among them is the oldest in the Urals 117-year-old specimen of the canary date, planted by the founder of the Gardens, professor Genkel. There are other foreign wonders in the gardens: century plants and cactuses, the dragon trees and monkey-puzzles, cyperusses, azaleas and orchids. The so-called “fruit collection” is very interesting and impressive. The cerimans, fig, feijoa, the citrus plants, desert grapes, coffee tree take turns blooming and bearing fruit. Up to 1 kg of seeds are produced per season. And that happens in the severe Urals climate! The pride of the gardens is plants for fun. These are the sensitive plant, cactus, the queen of the night, avocado, the carnivorous trumpetwood. And who heard of the iron, candy, sausage or wool tree? And why is the tuftroot called a tree for garrulous ladies and what is the difference between the live and the Venus’s hair?

The exhibit of the open soil is designed in natural landscape style. Alpine, hills, ponds and flower beds are a feast of the eye. The famous collection of French lilacs is truly unique and is known well beyond the boundaries of the region. And the names of the sorts, such as “Madame Lemoine”, “Buffon”, “Paul de Chanel” bring one thoughts of the far-away, but such a romantic and magnetic France. While looking at the dinner of carnivorous trumpetwood, one cannot help thinking: “Can it be the People’s Garden which the patron of arts and charities N.V.Meshkov was dreaming about and which professor A.G.Genkel did not have time to create?”

List of Directors of Perm State University Botanical Gardens (the years of their work are not always exactly known):

A.G.Genkel (1922-1927),
D.A.Sabinin (1927-1928),
V.I.Baranov (1929-1930),
E.A.Pavsky (1930-1941),
F.A.Bykov (1941-1948),
N.M.Kolmogorova (1948-1966),
V.S.Nikolayevsky (1966-1967),
V.M.Yatsenko (1967-1973),
L.I.Matviyenko (1974-1976),
V.T.Desyatsky (1976-1978),
A.N.Zakharov (1978-1980),
Y.N.Semyonov (1980-1984),
N.N.Portenier (1984-1985),
P.A.Babich (1986-1998),
S.A.Shumikhin (since 1999).

List of Works on the Botanical Gardens of Perm State University

Meyer E.A. Proekt ustroystva Narodnogo sada pri nochlezhnom dome imeni E.I.Meshkovoy. — g. Perm. M., 1916. 16 s.

[Meyer E.A. Project of establishing People’s Gardens at the Meshkova ward.]

Kertman L.E., Vasilyeva N.E., Shustov S.G. Perviy na Urale. Permskiy gosudarstvenniy universitet. 1916-1986. Perm: Kn. izd-vo, 1987.239 s.

[Kerman L.E., Vasilyeva N.E., Shustov S.G. The First in the Urals. Perm State University.]

Pavskiy E.A. Botanicheskiy sad imeni A.G.Genkel // 20 let Permskogo gosudarstvennogo niversiteta: Uch. zap. Yubileyniy vypusk. 1936. S. 37-48.

[Pavskiy E.A. The Genkel Botanical Gardens // 20 years of Perm State University: anniversary edition.]

Filatova L.A., Shumikhin S.A., Barmina E.V. Auditornye zanyatiya i nauchnye issledovaniya kak osnovnye sostavlyayuschiye universitetskogo obrazovaniya // Uchebny protsess v sovremennoy vysshey shkole: sodержatelnye, organizatsionnye i nauchno-metodicheskiye problemy: Materialy Mezhdunarodnoy nauchno-metodicheskoy konferentsii (Perm, Perm. un-t, 19-21 maya 2004g.)/ Perm, Perm. un-t, 2004. S.151.

[Filatova L.A., Shumikhin S.A., Barmina E.V. Lectures and scientific research as principal constituents of the University education.]

Shumikhin S.A. Botanicheskiy sad imeni professora A.G.Genkelya pri Permskom gosudarstvennom universitete: neizvestnye stranitsy istorii // Botanicheskiye sady Rossii: istoriya, mesto i rol v razvitiu sovremennogo obschestva: Tez. dokl. Solikamsk, 2001. S.49-50.

[Shumikhin S.A. The Professor Genkel Botanical Gardens at Perm State University: unknown pages of history.]

Shumikhin S.A. Botanicheskiye sady universitetov v sisteme vysshego obrazovaniya // Universitetskoye obrazovaniye I regiony: Tez. dokl. mezhdunar. nauch.-metod. konf./ Perm: Perm. un-t, 2001. S.116-118.

[Shumikhin S.A. Botanical Gardens of Universities as a part of the system of higher education.]

Shumikhin S.A. Botanicheskiy sad PGU // Osobo okhranyaemye prirodnye territorii Permskoy oblasti. Reestr. Perm: Knizhny mir, 2002. S.250.

[Shumikhin S.A. The Botanical Gardens of PSU.]

Shumikhin S.A. Ekologicheskaya tropa kak ekspozitsionniy kompleks Botanicheskogo sada // Botanicheskiye sady v sisteme ekologicheskogo obrazovaniya: Tez. dokl./ M., 2003. S.24.

[Shumikhin S.A. Ecological path as an exhibition complex of the Botanical Gardens.]

Shumikhin S.A. Botanicheskiy sad imeni professora A.G.Genkelya Permskogo gosudarstvennogo universiteta (istoricheskiy ocherk)// Rastitelniy pokrov Permskoy oblasti I ego okhrana: Mezhdvuzovskiy sbornik nauchnykh trudov. Perm, 2003. S.45-52.

[Shumikhin S.A. The Professor A.G.Genkel Botanical Gardens of Perm State University (historical sketch).]

Shumikhin S.A. Ekologicheskaya tropa kak ekspozitsionniy kompleks Botanicheskogo sada // Botanicheskiye sady v sisteme ekologicheskogo obrazovaniya. Materialy Pervoy vserossiyskoy konferentsii po ekologicheskomu obrazovaniyu v botanicheskikh sadakh (13-17 maya 2003g.). M.: Tisso, 2004. S.89-96.

[Shumikhin S.A. Ecological path as an exhibition complex of the Botanical Gardens.]

The major fields of the scientific and research work carried out at the Botanical Gardens of Perm State University

The Botanical Gardens' scientific and research work is conducted in accordance with the topic of "Introduction and Biology of Seed Reproduction of Decorative Arboreal, Brush and Herbal Plants".

The scientific and research work of the Botanical Gardens is connected with the introduction and acclimatization of plants, selection and development of new forms and sorts most resistant and productive in the Urals conditions. All research at Botanical Gardens of recent years has been conducted in the following directions:

- Development of the scientific grounding for the formation of the collection of the model phytocenosis of various climate zones in the open soil and in the Botanical Gardens' hothouse. With financial support of Environment Protection Department of Perm region, work has been conducted on designing and carrying out a project of creating an ecological path on the territory of Botanical Gardens with elements of model phytocenosis of the temperate climatic zone. Fragments of model

phytocenosis, such as “Pond”, “Peat Marsh”, “Highlands Plants”, “Far East Flora”, “Fragment of a Coniferous Forest”, “Lot of Protected Plants of Perm Region”. Path network has been established. For the first time in the Urals, 500 species of plants were planted based on the method of climatic analogs. A project of ecological path was developed with element of model phytocenosis of tropical and subtropical flora in the hothouse of Perm State University;

- Formation of a collection of protected species of plants of Perm region, studying their biology and reproduction characteristics with the purpose of reintroducing them into the natural habitats. A list of rare and disappearing plant species of Perm region has been compiled, which include 64 species that can be introduced at Botanical Gardens. Field expeditions are held, including: to national part “Vishersky”, protected landscape “Bolshestovskoye Boloto” of Usolye district, natural reserve “Lodeyny Log”, “Vetlan Stone” (Krasnovishersky district) and the Lunezhsky mountains (Polazna), as well as around the Tchaikovsky, Perm, Kungur, Kishert, Solikamsk districts of Perm region. At present, the collection includes 47 species of plants of various categories of rarity from 22 families included in the Red Book of Perm region. The collection of protected plant species will be used as a reserve for replenishing and restoring natural populations;

- Introduction into the culture and study of decorative and economically valuable representatives of the Urals flora. An analysis of wild flora of the Urals and Troitsa forest and steppe reserve has been conducted with the purpose of discovering decorative species and introducing them into culture. At present, about 50 types of decorative and economically valuable plants of these zones are grown on introduction lots of the Botanical Gardens;

- Study into the sexual polymorphism in populations of the several Urals species from the labitatae and the carnations families, among which this phenomenon is widespread. Seeds have been obtained from various source, a collection has been started;

- Development of the schemes for the selection process meant for decorative herbal plants of cloning reproduction. Base geophyte (earth plant)collections are available: the cross-bred gladiolus, the cultivated dahlia, the lilly genus. Certain stages of selection of the dahlia have been tested, and soon the complete method will be developed;

- Creation of the initial selection material of the cross-bred gladiolus, the cultivated dahlia, the cross-bred rose, and the common lilac employing hybridization and induced mutagenesis, selection and primary study of complex hybrids and mutants of the cross-bred gladiolus, the cultivated dahlia. 45 forms of the gladiolus and 2 forms of the dahlia having potential for receiving the status of a sort have been selected. In the future, their further study and reproduction is planned with the purpose of handing them over to the State Sort Testing Service;

- Study into the reproductive biology of the cultivated dahlia, the cross-bred gladiolus, the oriental poppy and the bractlet-shaped plants. The peculiarities of the 4 species’ antecology of the dahlia genus have been revealed. The reproduction strategy, seed productivity of the cultivated dahlia , the cross-bred gladiolus have been researched.

- Study into the peculiarities and optimization of methods of cloning, including in vitro, decorative herbal, arboreal and brush plants. Peculiarities of stages of microcloning the dahlia, African violet and other plants currently in demand have been studied. Methods of grafting arboreal and brush plants of difficult implantation have been modified. A scheme of developing scion-rooted planting material for lilacs.

The Botanical Gardens’ collection sock has grown over the past 5 years by 1399 species (2615 taxons). At present, stock collections of Botanical Gardens include 4000 species of plants represented by 6200 taxons.

Additions to the collection stocks are made in the form of seeds and live material received from other botanical gardens. Annually Botanical Gardens exchange seeds and planting materials with 24-44 botanical gardens of Russia and foreign countries. The volume of the annually received material is 242 to 840 species of plants. To a high degree the collections are increased through help of botanical gardens of the Urals and Povolzhye.

From June 18 to 22, 2012, a session of the Botanical Gardens Council of the Urals and Povolzhye was held in the university’s Botanical Gardens, in which 66 representatives of 21 botanical gardens and dendraria of the Urals and Povolzhye participated. The members of the Council and those invited to the session examined the collection stocks and the scientific and educational work carried out at the Botanical Gardens. Guests were given guided tours of protected territories of Perm region. According

to the decision made, "The Botanical Gardens Council of the Urals and Povolzhye marks the achievements of Botanical Gardens of Perm State University in creating the gardens' collections and its land improvement."

During the 2008-2012 five-year- period, 34 works in various directions of research were published. Within the framework of creating thematic exhibitions at the Botanical Gardens, a methodic alpinarium building guidebook was prepared for publication, which takes into account the peculiarities of the region. A list of plants recommended for growing in conditions of the Urals was compiled.

List of Recent Publications Accomplished by the Personnel of the Professor Genkel Botanical Gardens of Perm State University

1. Shumikhin S.A. K voprosu antekologii georginy kulturnoy // Sovremennye problemy ekologii, mikrobiologii i immunologii: Tez. dokl. Perm, 1999. S.72-74.
[Shumikhin S.A. On the issue of antecology of the cultivated dahlia]
2. Katalog kultiviruemykh drevesnykh rasteniy Rossii. Sochi-Petrozavodsk, 1999.
[Catalog of the cultivated arboreal plants of Russia]
3. Shumikhin S.A. Introduktsionnoe izuchenie sortovykh i gibridnykh semey georgin, vyraschivaemykh iz semyan v usloviyakh Preduralya // Floristicheskie i geobotanicheskie issledovaniya v Evropeyskoy Rossii. Saratov: Izd-vo Saratovskogo pedagogicheskogo instituta, 2000. S. 396-398.
[Introduction studies into the sort and hybrid families of the dahlia, produced from seeds in the conditions of the Urals]
4. Shumikhin S.A. Razmnozheniye georgin semenami // Vestnik Perm. un-ta. Biologiya. Perm: Perm. un-t, 2000. Vyp.2. S.50-52.
[Shumikhin S.A. The dahlia's reproduction by seeds]
5. Shumikhin S.A. Botanicheskiy sad imeni professora A.G.Genkelya pri Permskom gosudarstvennom universitete: neizvestnye stranitsy istorii // Botanicheskiye sady Rossii: istoriya, mesto i rol v razvitiy sovremennogo obschestva: Tez. dokl. Solikamsk, 2001. S.49-50.
[Shumikhin S.A. The Professor Genkel Botanical Gardens at Perm State University: unknown pages of history.]
6. Shumikhin S.A., Filatova L.A., Barmina E.V. Rol ekzogennykh fitogormonov v mikroklonalnom razmnozhenii georginy // Perspektivy razvitiya estestvennykh nauk v vysshey shkole: Trudy mezhdunar. nauch. konf. / ENI pri Perm. un-te i dr. Perm, 2001. T. IV. S.21-23.
[Shumikhin S.A., Filatova L.A., Barmina E.V. The role of exogenic fitohormones in the dahlia's microcloning]
7. Shumikhin S.A. Botanicheskiye sady universitetov v sisteme vysshego obrazovaniya // Universitetskoye obrazovaniye I regiony: Tez. dokl. mezhdunar. nauch.-metod. konf./ Perm: Perm. un-t, 2001. S.116-118.
[Shumikhin S.A. Botanical Gardens of Universities as part of the system of higher education.]
8. Filatova L.A., Shumikhin S.A., Barmina E.V. Vliyaniye ekzogennykh fitogormonov na nekotorye obmennye protsessy v tkanyakh georginy pri mikroklonalnom razmnozhenii // Vestn. Perm. un-ta. Biologiya. Perm: Perm. un-t, 2001. Vyp.4. S.80-85.
[Filatova L.A., Shumikhin S.A., Barmina E.V. The influence of exogenic fitohormones on some metabolism processes in tissues of the dahlia during microcloning]
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