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Overview of the II International Conference on Agribusiness, Environmental Engineering and Biotechnologies - AGRITECH-II - 2019

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Overview of the II International Conference on Agribusiness, Environmental Engineering and Biotechnologies – AGRITECH-II - 2019

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Abstract. The overview describes the main directions and results of the International Conference “AGRITECH-II-2019” held in Krasnoyarsk in November 13-14, 2019. It gives the details about the participants and the proceedings. The anchor partner of Krasnoyarsk Science and Technology City Hall was Krasnoyarsk State Agrarian University. A description of the main trends in modern agribusiness science as well as in the development of the university are given in the overview.

The Volume contains Proceedings of the II International Conference on Agribusiness, Environmental Engineering and Biotechnologies – AGRITECH-II-2019 which was held in Krasnoyarsk, Russian Federation in November 13-14, 2019.

The purpose of the Conference was to share the results and prospects of the achievements in using advanced high-tech chemical, biological and information technologies in agriculture and agribusiness, in the fields of energy, chemical, environmental, oil and gas engineering, mining and soil treatment technologies, as well as in modern areas of biodiversity and ecosystem stability research.

The Conference “AGRITECH-II-2019” was jointly organised by the International and Russian Union of Scientific and Engineering Associations (Moscow, Russia), Krasnoyarsk Regional Union of Scientific and Engineering Associations, Krasnoyarsk Science and Technology City Hall and Krasnoyarsk State Agrarian University.

The Program Committee and Editorial Board included prominent professors and scientists from the Russian Academy of Sciences, University of Maribor (Slovenia), Ruhr University in Bochum (Germany), Krasnoyarsk State Agrarian University (Russia), Siberian Federal University (Russia) as well as specialists from Russian and foreign leading industrial enterprises.

A wide range of fundamental and applied problems in various biological and agri-technological systems has undergone consideration during the meeting.

The II Conference was organised in 7 main directions:

- Agribusiness and Economics.
- Organization of Agribusiness and Agritech Engineering.
- Information Technologies, Automation Engineering and Digitization of Agriculture.
- Chemical, Ecological, Oil and Gas Engineering.



- Biological Technologies in Agriculture: from Molecules to Ecosystems.
- Environmental Engineering and Management, Mining and Soil Treatment Technology.
- Biodiversity and Ecosystem Stability.

The program of the Conference included keynote and plenary talks as well as numerous presentations of the participants (figure 1).



Figure 1. Plenary talks and sections.

The scientific session of the Conference was held at Krasnoyarsk State Agrarian University, which is a modern educational and scientific complex, the activity of which is aimed at training personnel for the agricultural sector, performing research and development of rural territories of the Krasnoyarsk Territory.

At Krasnoyarsk Agrarian University in order to strengthen the quality assurance of education a quality management system has been introduced since 2008, which is confirmed by certificates of compliance with the requirements of Russian and international standards.

In January 2017 the University confirmed the accreditation of the European Council on Business Education (ECBE).

This year, the university became a member of the international project of the Erasmus + program. The project is dedicated to the internationalization of master's programs in agriculture through teaching in English. The project partners were Germany, Great Britain, Greece, Kazakhstan, Mongolia and Russia. The coordinators were Freiburg Teachers' University and Tyumen State University.

Important directions of the University's development include improving the quality of educational activities through the development of innovative approaches to education, increasing the level of practical training, creating training centers equipped with modern technology and laboratory equipment, improving the targeted training of specialists for regional agribusiness in the system of higher and secondary vocational education, taking into account projected needs.

Work is underway to interact with the administration of the city of Krasnoyarsk in city improvement projects.

The University has land plots that are under the operational management. There is a set of agricultural machinery and equipment for carrying out field work, primary processing, drying, refinement and storage of grain (commodity and elite categories). Agricultural lands are used for research (including breeding), seed production, livestock production.

The university's R&D activities are aimed at partnership with agricultural producers of the region and improving the effectiveness of educational technologies.

The main areas of research and development are:

- development of theoretical and methodological foundations of new alternative farming systems, principles of ecologically safe land use, landscape-based land management projects;
- development of theoretical and methodological foundations for managing the phytosanitary state of agrocenoses, the creation of integrated systems for protecting plants from diseases and especially harmful pests;
- selection and seed production of potatoes, cereals, legumes and fodder crops;
- energy-saving agrotechnologies for production and processing of agricultural products;
- economic mechanisms to ensure the sustainable development of the agro-industrial complex and rural areas;
- small distributed energy and the use of renewable energy sources for energy supply of agricultural consumers;
- effective livestock and farm animal health technologies;
- development and implementation of the principles of organic farming, elements of the precision farming system.

Three breeding achievements were created, patented and included in the State Register: potato varieties Krasnoyarskiy early and Aramis, soybean variety Zaryanitsa. New promising varieties of potato, soy and beans have been prepared for state testing. Seed production of the most important agricultural crops is underway: barley, wheat, peas, soybeans.

The University is the winner of federal competitions of the Ministry of Education and Science of the Russian Federation and the Ministry of Agriculture of the Russian Federation):

- The program for the development of innovative infrastructure of the Krasnoyarsk State Agrarian University (in accordance with Decree of the Government of the Russian Federation No. 219);

- Creation of a comprehensive high-tech production of vegetable oilseeds and products of its processing in Siberia. The programme is being implemented jointly with the industrial partner LLC OPK Solyanskoye (Agreement No. 074-11-2018-016 of May 29, 2018). Krasnoyarsk State Agrarian University is the leading contractor for R&D;
- Development of selection and seed production of potato varieties adapted to growing conditions in the Krasnoyarsk Territory and Eastern Siberia. The project is being implemented jointly with the industrial partner LLC “SHP Dary Malinovki” within the framework of the Federal Target Program “Development of Agriculture of the Russian Federation” for 2017-2025.

Each year, the university receives funding for research on the state order of the Ministry of Agriculture of Russia, participates in competitive programs of the Russian Foundation for Basic Research (RFBR).

Currently, the main projects for the development of the university are as follows:

- Participation in the scientific and technological support of the Regional investment programme “Yenisei Siberia”.
- Design and construction of an educational, scientific and industrial complex in the village of Borsk.
- Valorization of wild plants (berries) of the Siberian region in the food industry and bio-industry. The project was developed jointly with the Korean National University of Kyeongbuk (Daegu, South Korea) and submitted to the competition in accordance with Decree of the Government of the Russian Federation No. 220.

Agriculture is one of the priority areas for the development of our country. Therefore, the task of the Krasnoyarsk Agrarian University is not only to provide highly qualified personnel for agricultural producers, but also to promote the introduction of scientific developments in agricultural production.

The international scope of the Conference was confirmed by the participation of representatives from 9 countries besides Russia (Belarus, Kazakhstan, United Kingdom, Egypt, Turkey, China, Ukraine, Uzbekistan, Tajikistan):

- | | |
|--|---|
| • Belarus State Economic University, Minsk, Belarus; | Belarus for Potato, Fruit and Vegetable Growing, Minsk, Belarus |
| • Bioniq Health-Tech Solutions Ltd., London, United Kingdom | • Tajik State University of Commerce, Dushanbe, Republic of Tajikistan; |
| • Dmanhour University, Dmanhour, Egypt; | • Tashkent institute of irrigation and agricultural mechanization engineers Tashkent, Uzbekistan; |
| • Donetsk National University, Donetsk, Ukraine | • The Tajik state university of finance and economics, Dushanbe, Tajikistan, |
| • Huazhong Tectonomechanical Research Center, Wuhan, China | • Zhetysu State University named after I. Zhansugurov, Taldykorgan, Kazakhstan |
| • Inonu University, Malatya, Turkey | • Sarsen Amanzholov East Kazakhstan State University, Ust-Kamenogorsk, Kazakhstan |
| • Laboratory of Medical Expert System «Anthropos Systems Lab.», Vinnitsa, Ukraine; | • School of Earth Sciences, China |
| • Research and Practical Centre of National Academy of Sciences of | University of Geosciences, China. |

The participants from Russia (more than 50 regions) represented over 200 universities, scientific institutes and organisations, industrial enterprises:

- All-Russian Research Institute of Agricultural Biotechnology, Moscow
- All-Russian Research Institute of Experimental Veterinary Medicine named after K.I. Scriabin and Ya.R. Kovalenko of the Russian Academy of Sciences, Belgorod
- All-Russian Research Institute of Forestry and Forestry Mechanization, Pushkino
- All-Russian Research Institute of Physiology, Biochemistry and Nutrition of Animals, Borovsk
- All-Russian Rice Research Institute, Krasnodar
- Altai State University, Barnaul
- Amur State University, Blagoveshchensk
- Anapa Zonal Experimental Viticulture and Winemaking Station
- Astrakhan State University of Architecture and Civil Engineering
- Balashov Institute of Saratov State University
- Bashkir State Agrarian University, Ufa
- Bashkir State Medical University, Ufa
- Bashkir State University, Ufa
- Belgorod State Agrarian University named after V.Ya. Gorin
- Blagonravov Institute of Mechanical Engineering, Russian Academy of Sciences, Moscow
- Bunin Yelets State University
- Center of hygienic expertise Ltd, Kemerovo
- Central Research Institute of Dental and Maxillofacial Surgery, Moscow
- Chechen Agricultural Research Institute, Grozny, Chechen Republic
- Chechen State Pedagogical University, Grozny, Chechen Republic
- Chechen State University, Grozny, Chechen Republic
- Chuvash I. Yakovlev State Pedagogical University, Cheboksary
- Chuvash State Agricultural Academy, Cheboksary
- Chuvash State University named after I.N. Ulyanova, Cheboksary
- Dagestan State Pedagogical University, Makhachkala
- Dagestan State University of National Economy, Makhachkala
- Far Eastern State Agrarian University, Blagoveshchensk
- Far Eastern State Technical Fisheries University, Vladivostok
- Far Eastern Zonal Research Institute, Blagoveshchensk
- Federal Agricultural Research Center of the North-East named N.V. Rudnitsky, Kirov
- Federal Center for Cerebrovascular Pathology and Stroke of Ministry of Healthcare of Russian Federation, Moscow
- Federal Center for Toxicological, Radiation and Biological Safety, Kazan
- Federal Research Center for Fundamental and Translational Medicine, Novosibirsk
- Federal Research Center Krasnoyarsk Science Center of the SB RAS, Krasnoyarsk
- Federal Research Center of Food Systems named V.M. Gorbatov RAS, Moscow
- Federal Research Centre of Biological Systems and Agrotechnologies RAS,
- Federal Science Center for Animal Husbandry named after Academy Member L.K. Ernst
- Federal Scientific Centre VIEV, Moscow
- Financial University under the Government of the Russian Federation, Moscow
- Gagarin research & test cosmonaut training center, Moscow
- Gorsk State Agrarian University, Vladikavkaz
- Gubkin Russian State University of Oil and Gas, Moscow
- I.M. Sechenov First Moscow State Medical University
- Innovative Pharmacology Research, Tomsk
- Institute of Biomedical Chemistry, Moscow
- Institute of Computational Modelling SB RAS, Krasnoyarsk
- Institute of Ecology and Genetics of Microorganisms, Russian Academy of Sciences, Perm Federal Research Center
- Institute of Penitential System of Russia, Voronezh
- Irkutsk Baikal state University
- Irkutsk National Research Technical University
- Irkutsk State Agrarian University named after A.A. Ezhevsky
- Irkutsk State Transport University
- Ivanovo State Polytechnic University
- Izhevsk state agricultural Academy, Kalasnikov

- Izhevsk State University
- K. G. Razumovsky Moscow State University of Technologies and Management (the First Cossack University), Moscow
- Kabardino-Balkarian State Agricultural University named after V.M. Kokov, Nal'chik
- Kazan Cooperative Institute (Branch) Russian University of Cooperation
- Kazan Federal University
- Kazan National Research Technological University
- Kazan State Academy of Veterinary Medicine by N.E. Bauman
- Kazan State Agrarian University
- Kazan State Power Engineering University
- Kemerovo state university
- Kh. Dosmukhamedov Atyrau State University
- Kologrivsky Forest Nature Reserve
- Komarov Botanical Institute of RAS, St. Petersburg
- Kozma Minin Nizhny Novgorod State Pedagogical University (Minin University), Nizhny Novgorod
- Krasnodar Research Centre for Animal Husbandry and Veterinary Medicine
- Krasnoyarsk Research and Development Institute of Agriculture, Separate Division of FRC KRC, SB RAS
- Krasnoyarsk State Agrarian University
- Krasnoyarsk state pedagogical University named after V. P. Astafiev
- Krasnoyarsk technical school of social technology
- Kuban State Agrarian University named after I. T. Trubilina, Krasnodar
- Kurgan State University
- Kursk state agricultural Academy
- Kursk state University
- L.K. Ernst Federal Science Center for Animal Husbandry
- LLC "GreenAgro", Yoshkar-Ola
- LLC "Sufude", Krasnoyarsk
- Lomonosov Moscow State University
- Lorch Potato Research Institute, Moscow
- M. K. Ammosov North-Eastern Federal University, Yakutsk
- Mari Agricultural Research Institute – branch of Federal Agrarian Research Center of the North-East named N.V. Rudnitsky, Ruem, Mari El Republic
- Mari State University, Yoshkar-Ola
- Maternity Hospital No. 3 of the Department of Health of the Tyumen Region
- Michurinsk State Agrarian University
- Ministry of agriculture and food of the Republic of Tuva
- MIREA - Russian Technological University, Moscow
- Moscow State Academy of Veterinary Medicine and Biotechnology – MVA named after K.I. Skryabin
- Moscow State Automobile and Highway Technical University (MADI), Cheboksary
- Moscow State Technical University named after N. E. Bauman
- Moscow State University of Civil Engineering (National Research University)
- Moscow State University of food production
- Moscow Technical University of communications and informatics
- Murmansk Arctic State University
- Murmansk State Technical University
- Mytischki Branch of Bauman Moscow State Technical University,
- National Research University of Information Technologies, Mechanics and Optics, St. Petersburg
- Nizhny Novgorod state engineering and economic university, Knyaginino
- Nizhny Novgorod State Technical University named after R.E. Alekseev
- North Caucasus Federal University
- North Ossetian State University named after K. L. Khetagurova, Vladikavkaz
- Northern (Arctic) Federal University named after M.V. Lomonosov, Arkhangelsk
- Northern Trans-Ural SAU, Tyumen
- Novosibirsk State University of Economics and Management
- NRC "Kurchatov Institute", Moscow
- Omsk ASC
- Omsk state Agrarian University named after P A Stolypin
- Omsk State Technical University
- Orel State University of Economics and Trade
- Oryol State University named after I.S. Turgenev
- Peoples' Friendship University, Moscow
- Perm Institute of the FPS of Russia
- Perm Military Institute of National Guard Troops of the Russian Federation

- Perm National Research Polytechnic University
- Perm State Agrarian-Technological University named after academician D N Prianishnikov
- Peter the Great St. Petersburg Polytechnic University
- Petrozavodsk State University
- Pirogov Russian National Research Medical University, Moscow
- Platov South-Russian State Polytechnic University (NPI)
- Plekhanov Russian University of Economics, Moscow
- Plekhanov Russian University, Moscow, Russian Federation
- Polytechnic Institute (branch) of Don State Technical University in Taganrog
- Polzunov Altai State Technical University
- Presidential Academy of National Economy and Public Administration, Orel
- Primorskaya State Academy of Agriculture, Ussuriisk
- Privlzhsky Research Medical University, Nizny Novgorod
- Pushkin State University
- Republican Children's Ecological and Biological Center, Ufa
- Research Centre for Medical Genetics, Moscow
- Research Institute of Human Morphology, Moscow
- Reshetnev Siberian State University of Science and Technology Krasnoyarsk
- Rostov Institute for Protection of Entrepreneurship
- Rostov State University of Economics, Taganrog
- Russian Medical Academy of Continuous Professional Education, Moscow
- Russian Presidential Academy of National Economy and Public Administration, Perm branch
- Russian State Agrarian University-Moscow Timiryazev Agricultural Academy, Moscow
- Russian State Social University, Moscow
- Ryazan state agrotechnological university of P.A. Kostychev, Ryazan
- Ryazan State University Named for S. Yesenin
- Saint Petersburg State Agrarian University
- Saint Petersburg State University of Aerospace Instrumentation
- Saint Petersburg State University of Industrial Technologies and Design
- Saint Petersburg State University of Industrial Technology and Design
- Saint-Petersburg State Forest University
- Saint-Petersburg State University
- Samara State Agrarian University, Kinel
- Saratov State Agrarian University named after N.I. Vavilov
- Saratov State University
- School No. 2, the urban district of Kotelniki, Kotelniki
- Secondary school of the village Khoperskoe Balashov district
- Sevastopol Branch of the Plekhanov Russian Economic University
- Sholom-Aleichem Priamursky State University, Birobidzhan
- Siberian Botanical Garden, Tomsk State University, Tomsk
- Siberian Branch of the Russian Academy of Sciences, Irkutsk
- Siberian Federal University, Krasnoyarsk
- Siberian Law Institute of the Ministry of Internal Affairs of Russia
- Siberian State Medical University, Tomsk
- Sochi state University
- South Ural State University, Chelyabinsk
- South-West state University, Kursk
- St. Petersburg State Agrarian University
- State Humanitarian Technological University, Orekhovo-Zuevo
- State Regional Center for Standardization, Metrology and Testing in the Krasnoyarsk Territory, Republic of Khakassia and Republic of Tuva, Krasnoyarsk
- State Research Center of Virology and Biotechnology «Vector»
- State Technical University, Institute of the Federal Penitentiary Service
- State University of Management Russia, Moscow
- Stavropol branch of the Moscow Pedagogical State University
- Stavropol State Agrarian University
- Sukachev Institute of Forest SB RAS, Federal Research Center «Krasnoyarsk Science Center SB RAS»
- Surgut State University
- T.F. Gorbachev Kuzbass State Technical University, Kemerovo
- Herzen State Pedagogical University of Russia

- Institute of Ecology and Evolution A.N. Severtsov RAS, Moscow
- North Caucasian Research Institute of the Vladikavkaz Scientific Center of the Russian Academy of Sciences, Vladikavkaz
- Perm Military Institute of the National Guard Forces of the Russian Federation
- Russian Presidential Academy of National Economy and Public Administration, Chelyabinsk branch, Chelyabinsk
- Tomsk Polytechnic University
- Tuvan State University, Kyzyl
- Tver State Agricultural Academy,
- Tyumen State Medical University of the Ministry of Health of Russia
- Udmurt State University, Izhevsk
- Ufa Institute of biology - Subdivision of the Ufa Federal Research Centre of the Russian Academy of Sciences, Ufa
- Ufa State Petroleum Technological University Branch in Sterlitamak, Sterlitamak
- Ural Institute of State Firefighting Service of EMERCOM of Russia, Ekaterinburg
- Ural State University of Economics, Ekaterinburg
- V. I. Il'ichev Pacific Oceanological Institute, Vladivostok
- V.I. Vernadsky Crimean Federal University, Simferopol
- Vernadsky Institute of Geochemistry and Analytical Chemistry, Moscow
- Vladikavkaz Scientific Center of the Russian Academy of Sciences
- Vladimir State University named after A.G. and N.G. Stoletov
- Volga State University of Technology, Yoshkar-Ola
- Volgograd State Agricultural University
- Volgograd State Medical University
- Volgograd State Technical University
- Vologda State Dairy Farming Academy named after N.V. Vereshchagin
- Voronezh institute of high technologies
- Voronezh Institute of Ministry of the Interior of Russia
- Voronezh Institute of the Federal Prison Service of Russia
- Voronezh State Agrarian University named after Emperor Peter the Great
- Voronezh State Technical University
- Voronezh State University of Engineering Technologies
- Vyatka State Agricultural Academy, Kirov

The event has offered a platform for bringing together students, postdocs, innovative academics and industrial experts to exchange their ideas and contribute new engineering approaches to research agri-mechanical and automation processes in various technological-, biological- and eco-systems. Great interest was aroused by the section devoted to economics and organization of agritech engineering, biological technologies, biodiversity and ecosystem stability.

The Conference provided the premier interdisciplinary and multidisciplinary forum for researchers, practitioners and educators to present and discuss the most recent innovations, trends, concerns, practical challenges encountered and the solutions adopted in the fields of environmental and biological sciences, agritech engineering, chemical, mining and soil treatment technologies, digitization of agriculture, etc. Although the schedule of the Conference was very tight, there were very vivid discussions among the participants. The participants who could not come to the Conference due to different reasons including the problem of high transportation costs presented on-site presentations which are available on the website of the Conference.

All participants were invited to present their papers in this Volume and all submitted manuscripts went through the independent peer review process. We are very grateful to all reviewers from Russia, China, USA, Slovenia, Germany and Republic of Kazakhstan for their time and highly professional comments. We deeply believe that their reviews gave opportunity to improve the scientific quality of the presented papers which may be useful for academic, scientific and agri-industrial partners.

More than 500 reports were submitted to the Organizing Committee of the Conference. 310 reports were selected for inclusion into this Volume after the review process. All the papers were subjected to rigorous peer-review by conference committee members and international reviewers. The papers were selected based on their quality and relevance to the Conference directions and on the results of their presentation at the Conference session. The proceedings present to the readers the recent advances in

the field of agribusiness, economics and organization of agritech engineering, biological and information technologies, environmental, chemical, ecological, power, oil and gas engineering. These papers reflect modern engineering approaches in all Conference directions, broaden the researches of the previous Conferences [1-3].

We chose the IOP Conference Series: Earth and Environmental Science (EES) to provide all contributors with the opportunity to publish their papers in an international, peer-reviewed journal. This is understood and appreciated by all the participants of our Conference, and therefore this Volume provides an excellent overview of the main topics of our Conference. The Proceedings of the I Conference AGRITECH were published in IOP Conference Series in August 2019 [3].

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On behalf of the conference committee and organizers, we would like to thank all the authors who contributed to this Volume as well as to the reviewers, speakers and all the conference participants for their support to AGRITECH-II-2019.

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