

**The 2019 Silk Road
Agricultural Education
and Research Cooperation Forum**

***INTERNATIONAL CONFERENCE
THE TECHNOLOGY TRANSFER
IN AGRICULTURE
- FROM UNIVERSITY RESEARCH
TO INNOVATION***

PROGRAM BOOK & ABSTRACTS

Poznan, 24-27 September 2019

Silkroad Agricultural Education and Research Innovation Alliance
Poznań University of Life Sciences

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INTERNATIONAL CONFERENCE THE TECHNOLOGY TRANSFER IN AGRICULTURE - FROM UNIVERSITY RESEARCH TO INNOVATION

**The 2019 Silk Road
Agricultural Education and Research Cooperation Forum**



Edited by
Krzysztof Szoszkiewicz
Daniel Gebler

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ALLIANCE

Silkroad Agricultural Education and Research Innovation Alliance

The Alliance was established in Yangling in 2016. The aim of the Alliance is to strengthen the cooperation in the fields of education, research and cultural exchange among the universities, research institutes and enterprises related to the agriculture in the countries along the Silk Road. There are 76 members of the Alliance from the 14 countries.

Silk Road Agricultural Education and Research Cooperation Forum

The Forum is organized every year since 2016. During the Forum alliance council members meeting takes place aiming at developing the annual plan of the Alliance for the following year. The Forum establishes a common ground for cooperation among the Alliance members. During the Forum new members are accepted to join the Alliance. So far the Forum has been organized four times and the hosts of previous meetings have been presented below:

2016 – Yangling, China
2017 – Astana, Kazakhstan
2018 – Novi Sad, Serbia
2019 – Poznan, Poland

The 2019 Forum in Poznan

The 2019 Forum is organized as an International Conference with the following leitmotif: The technology transfer in agriculture – from university research to innovation. During Forum 2019, ways of effectively implementing research results into practice will be discussed. We count on messages from Alliance Members about what implementation methods are used. We also provide information on the achievements recently taken that have a large practical application and should be disseminated.

During the 2019 we celebrate in Poznan the 100th anniversary of agricultural and forestry studies. In the 2019 the University of Poznan was established with the Agronomy and Forestry Faculty. The 2019 Forum and the arrival of presidents of notable agricultural universities worldwide is an additional element of the celebrations of the 100th anniversary of university tradition in Poznan.

ORGANIZING COMMITTEE

Local organisers

Krzysztof Szoszkiewicz – Chair

Marta Szostak – Forum coordination

Roman Hołubowicz

Xianzong Xia

Anna Budka

Dariusz Kayzer

Daniel Gebler

Paweł Strzeliński

Joanna Chmist-Sikorska

Klaudia Borowiak

Agnieszka Ławniczak-Malińska

Maria Drapikowska

Lidia Huchwajda

Joanna Pietrzak

Łukasz Sobiech

Zuzanna Sawińska

Maciej Kujawski

Krzysztof Pawlak

FRAME PROGRAM

SEPTEMBER 24TH, TUESDAY

Arrival of participants – transfer from the Poznan Airport to hotels.

16:00 Executive Board meeting

19:00 Welcome reception – Novotel Hotel restaurant

SEPTEMBER 25TH, WEDNESDAY (PLACE – BIOCENTRUM)

10:00 Opening ceremony

- Organizing Committee
- Rector of the Poznan University of Life Sciences
- President of the Northwest A&F University
- Authorities

11:00 Cafe/Tea

11:20 Conference session I

- Key-note presentation – Polish
- Key-note presentation – Chinese
- Other presentations

13:05 Lunch

14:00 Conference session II

- Presentations

16:00 Visiting laboratories and Przybroda Experimental Station

19:00 Dinner

SEPTEMBER 26TH, THURSDAY (PLACE – BIOCENTRUM)

9:00 Conference session III

- Presentations

10:30 Coffee/Tea

11:00 Conference session IV

- Presentations
- Discussion

12:45 Closing ceremony

13:30 Lunch

14:30 Fascinating Poznan – sightseeing tour

20:00 Gala dinner

SEPTEMBER 27TH, FRIDAY

Free time

Airport transfers

SEPTEMBER 28TH, SATURDAY

Airport transfers

LIST OF PRESENTATIONS

SESSION I

1. Łukasz Sobiech

Poznan University of Life Sciences, Poland

Megatrends in agriculture - affecting science, technology and innovation

2. Wang Jinjun

Southwest University, China

International cooperation on agriculture education and scientific research in Southwest University

3. Ding Yanfeng

Nanjing Agricultural University, China

University extension through agricultural technology transfer: the NAU model

4. Gao Julin

Inner Mongolia Agricultural University, China

Assist the Belt and Road Initiative, serve regional rural vitalization

5. Sanja Vasiljevic

Institute of Field and Vegetable Crops, Serbia

Opportunities and challenges in the field of agronomic research and teaching activities on the New Silk Road

6. Wang Ran

Jiangsu Academy of Agricultural Sciences, China

Exploration and practice of agricultural science and technology and achievements extension service

7. Weixing Shan

Northwest A&F University, China

Development of joint agrotechnology parks for accelerated collaboration in agricultural education and research in Kazakhstan

SESSION II

1. Tomasz Czech

University of Agriculture in Krakow, Poland

Open Innovation Space at the University of Agriculture in Krakow

2. Hu Zeyou

New Rural Development Institute Hunan Agricultural University, China

Promotional Model on Scientific and Technological Achievements of Modern Agriculture - Taking Hunan Agricultural University for Example

3. Fan Bingxiang

Shanxi Agricultural University; China

Practice and exploration of promoting the transformation of science and technology in Shanxi Agricultural University under the background of "The Belt and Road Initiative"

4. Liu Minhui

Shaanxi Provincial Agricultural Reclamation Group, China

Playing the role of enterprises expanding exchanges and cooperation

5. Muhammad Ashraf

University of Agriculture Faisalabad, Pakistan

One Belt One Road: Potential Initiatives Undertaken by the University of Agriculture Faisalabad, Pakistan

6. Salimzoda Amonullo Faizullo

Tajik Agrarian University named after Shirinshoh Shohtemur, Tajikistan

The achievement of scientists of the TAU in the field of science

7. Askar Nametov

Zhangir Khan West Kazakhstan Agrarian-Technical University, Kazakhstan

Building sustainable development through technology transfer in Zhangir Khan University

8. Mikhail Volkov

Belarusian State Agricultural Academy, Belarus

Innovative methods for transforming agricultural technology into production

SESSION III

1. Roman Hołubowicz

Poznan University of Life Sciences, Poland

Plant breeding and seed production - new technologies extension between Poland and China

2. Serik Jantassov

Kazakh National Agrarian University, Kazakhstan

Innovative technologies of the Kazakh National Agrarian University for the agro-industrial complex

3. Li Xin

Crop Research Institute, Ningxia Academy of Agricultural and Forestry Sciences, China

Innovation and Application of Middle-Early Matured Corn Germplasm in Ningxia

4. Liu Gang

Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, China

Advances in resource utilization of potato processing wastes

5. Liu Gang

The Sericultural Research Institute, Sichuan Academy of Agricultural Sciences, China

Current status and future prospects of sericulture in Sichuan province

6. Zheng Deqiang

International Cooperation and Exchange, China

Agro-forestry technological and innovative collaboration along with the Silkroad

7. Wang Quanhua

Shanghai Normal University, China

Advances in quality breeding of spinach and tomato

SESSION IV

1. Klaudia Borowiak

Poznan University of Life Sciences, Poland

New trends in environmental engineering and spatial planning in relation to agricultural sciences

2. Branko Milošević

Institute of Field and Vegetable Crops, Serbia

The Silk Road Partnership: Case of the Institute of Field and Vegetable Crops, Novi Sad, Serbia

3. Wei Feng

College of Economics and Management, Northwest A&F University, China

Agricultural Science and Technology Cooperation Mode in Central Asia

4. Awais Raoof

University of Lahore, Pakistan

One Belt One Road: Initiatives by the University of Lahore, Lahore, Pakistan

5. Wu Yantao

Shandong Agricultural University, China

Bring into Full Play the Scientific and Technological Advantages of Agricultural Universities. Promote the Innovation and Development of "The Silk Road"

6. Zhang Bolin

School of Biological Science and Biotechnology, Beijing Forestry University, China
Through innovation to help local farmers to gain rich: a case in Lvyang

7. Zhang Lixin

College of Life Sciences, Northwest A&F University, China
The New Concept of Bio-health Agriculture and the Case of Main Industry Implementation: The Only Way for the Development of Modern Agriculture in the World

POSTER SESSION

1. Agnieszka Ławniczak-Malińska

Poznan University of Life Sciences, Poznan
Protection and recultivation of lake ecosystems and valuable natural areas

2. Alim Pulatov

Central Asia and South Caucasus Consortium of Agricultural Universities for Development, Uzbekistan
CASCADE universities experience in technology transfer in agriculture

3. Bakhadir Mirzaev

Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Uzbekistan
TIAME experience in research transfer to land and water resources management

4. Ivan Sleptsov

Yakut State Agricultural Academy, Russia
Yakut State Agricultural Academy as driver of agricultural scientific-educational cluster in agro-industrial complex of the Russian North-East

5. Xia Xianzong, Hołubowicz Roman

Department of Plant Pathology, Poznan University of Life Sciences, Poland
French Seed Industry System

6. Mo Zhou

Faculty of Architecture, Poznan University of Technology, Poland
Vertical Farming is developed as a Sustainable Innovation Farming Technique for Urban Areas

ABSTRACTS

molecular markers to serve the improvement of spinach quality and breeding efficiency. Meanwhile, the molecular basis of small RNA-mediated resistance to tomato virus disease is also one of our research directions.

NEW TRENDS IN ENVIRONMENTAL ENGINEERING AND SPATIAL MANAGEMENT IN RELATIONS TO AGRICULTURAL SCIENCES

Klaudia Borowiak
Faculty of Environmental Engineering and Spatial Management,
Poznan University of Life Sciences, Poland

The negative effect of human activity to environment is well known, also this is connected to agricultural aspects. There are several ways to decrease, balance or avoid these effects. The tools of environmental engineering and spatial management helps to monitor the status of environment, as well as to reduce or predict negative effects of human activities to environment.

There are several research on new solutions in environmental engineering and spatial management at Poznan University of Life Sciences. Water deficit and quality is one of the biggest problem in the agricultural, hence many investigations are done to monitor and improve water quantity and quality, such as: controlled drainage system for controlling the water outflow from the area, water contamination detection system based on bioindicational reaction of bivalves, monitoring of trace elements in river catchments, including rare earth elements, biomonitoring of water quality using macrophytes, lake and river restoration, impact of agriculture and industry on freshwater ecosystem, innovative wastewater collection and treatment systems in rural areas, projects of environmental friendly fish passes.

The climate changes effects on ecosystems are also investigated. New methods for active and passive climate manipulation are developed at the Faculty. Additionally, new methods of impact assessment of the atmosphere physical properties on plant productivity are developed and innovative prototyped measuring systems are applied. Another topic related to climate change - disturbances effect on carbon and water fluxes exchange over forests.

The reduction of negative effect of industry on agricultural areas is also investigated at the Faculty, such as management of post-mining waste and land reclamation of post-mining areas. Spatial management can help to

predict and minimize, as well as mitigate the negative effect to the environment. Several tools are used and tested to evaluate potential effect to environment and landscape, including agricultural areas, such as application of GIS and 3D modelling techniques in visual impact assessment and landscape protection, assessment of road effect on landscape by GIS tools, evaluation of environmental pollutions distribution in the selected areas.

THE SILK ROAD PARTNERSHIP: CASE OF THE INSTITUTE OF FIELD AND VEGETABLE CROPS, NOVI SAD, SERBIA

**Milošević B., Vasiljević S., Karagić Đ., Mihailović V., Milić D., Đalović I.,
Katanski S., Živanov D., Dolapčev A., Uhlarik A.**
Institute of Field and Vegetable Crops, Novi Sad, Serbia

Institute of Field and Vegetable Crops, Novi Sad, Serbia has an 80-year long tradition in plant breeding and seed production. The Institute's basic activities include scientific research, extension services, and production of the basic categories of its own seed. It is a well-developed chain from the basic science, through breeding and seed production, to seed market and farmers. With over 100 researchers, the Institute is one of the largest institutions of its kind in southeast Europe. Its fundamental and applied research are primarily focused on the development of the high-yielding field and vegetable crop cultivars, including forage and industrial crops, medicinal plants and spice herbs tolerant to major diseases and resistant to unfavourable biotic and non-biotic factors. The Institute has a well-developed international scientific cooperation, and it participates in various international and bilateral projects. In addition to research, the Institute develops its commercial sector and thereby functions both as a research institute and a seed company. The Institute has created a new seed brand 'NS seme', which has already become a synonym for high quality and high yield. Over 1000 cultivars of field and vegetable crops have been developed at the Institute so far. Of that number, almost 500 have been registered and commercially grown abroad. The institute's cultivars compete for their place at seed markets of 26 countries, from Argentina, through EU countries, Ukraine and Russia, to China and India.

The Institute of Field and Vegetable Crops has a rich history of successful cooperation with the P.R. China. This cooperation began back in 1980 in the form of expert exchange during which experts from the Institute held

two-week seminars for Chinese experts. The Institute of Field and Vegetable Crops has recently established successful scientific and educational cooperation with numerous institutions along the New Silk Road, by participating in bilateral and international projects related to forage legumes, soybean, sunflower, corn, vegetable crops, medicinal plants, and so on.

As a member of the Silkroad Agricultural Education and Research Innovation Alliance, founded in China by the Northwest A & F University, in 2016-2019 the Institute of Field and Vegetable Crops has signed several agreements on scientific and technical cooperation (notably the Memorandum of Understanding) with research institutes and universities from Eurasian countries, such as China, Kazakhstan, Russia, Iran (Northwest A&F University, Yangling; Industrial Crops Institute, Heilongjiang Academy of Agricultural Sciences, Harbin; China Agriculture University; Shanghai Normal University; Kazakh National Agrarian University, Almaty; Omsk State Agrarian University, Russia; Moghan Scientific & Vocational Institute for Agriculture, Iran). On two occasions, the Institute hosted the course "Advancements in plant breeding trial design and analysis" in cooperation with UC Davis Plant Breeding Academy, designed to provide training in plant breeding and germplasm improvement. The most important items of the Memorandum of Understanding are 1. Exchange of academic staff and students, 2. Research in related fields, 3. Joint research projects, and 4. Organization of scientific meetings and academic forums.

Long-term experience in plant breeding and seed production, as well as a wide array of agronomic research at the Institute of Field and Vegetable Crops, are very attractive for PhD students who come from Eurasian countries, and who attended different courses. Scientists from the Institute supervise the preparation of doctoral, master and bachelor's theses. The Institute provides the necessary equipment, experimental fields and other facilities. At the end of the course, students receive a certificate of course completion. A lot of challenges exist along the New Silk Road, but one of the most important in agriculture is how to reduce the Eurasian continent's dependency on protein imports. Since 2017, the Institute of Field and Vegetable Crops has participated in the joint EU-China project (EUCLEG-Horizon 2020) with 10 institutions from China, focused on the joint plant breeding program of protein-rich legumes which have a positive environmental impact.

In the recent years, the interest in the development of highly-sophisticated technologies (phenotypic tools and techniques) has particularly increased. The new technologies have been developed for the purpose of screening

the most important, primarily agronomic and physiological, traits of cultivated plants under different environmental conditions. Research conducted during the joint project "Characterizing root traits for efficient water and nutrient acquisition in maize" with Northwest A & F University, which is very well equipped with highly-sophisticated platforms for phenotyping, focused on phenotypisation of the cultivated plant root system. Root system architecture (RSA) is one of the basic components of plant productivity and plays an important role in tolerance towards different types of stress. The study of RSA explains its shape and structure, which contribute to the creation of roots suitable for specific agroecological conditions. Knowledge of the root system characteristics, as well as understanding the mode of inheritance of its particular properties is of great importance for breeders, especially with regard to the role of the root system in various environmental conditions, such as excessive humidity, acidity, alkalinity, drought, limited availability of nutrients, etc. Furthermore, phenotypisation is not only the key to genomics, but also has particular importance for explaining mechanisms and processes in the relationship between the root system architecture and soil. Different strategies and techniques of root phenotypisation have been developed due to the need to analyse roots of various plant species, different genotypes, and effects of specific environmental factors. Modern methods have enabled research of RSA in laboratory and field conditions, as well as in glasshouses. The development of future drought-tolerant genotypes, with increased efficacy in water and nutrient absorption, relies on a better understanding of the structure and functioning of plant roots and is essential for improved adaptation of crops in breeding operations.

Since its establishment, the Institute of Field and Vegetable Crops has taken part in organization of international conferences and national scientific and professional meetings. On July 2-4, 2018, the Institute hosted 3rd Silk Road Agricultural Education and Cooperation Forum at the Rectorate of the University of Novi Sad. About 120 participants from 35 institutions attended the Forum, mainly from the universities and research institutes of China, Russia, Kazakhstan, Jordan, Poland, Netherlands, Iran, Hungary, and Serbia, including the representatives of the Faculty of Agriculture Novi Sad, Faculty of Agriculture Čačak, Faculty of Agriculture and Faculty of Forestry, University of Belgrade. In the next two years, the Institute will host three scientific meetings: 20th International Sunflower Conference, 20-25 June, 2020, 11th World Soybean Research Conference, 06-11 September, 2020, and 11th International Herbage Seed Group Conference, 06-13 June, 2021, which confirms the important place of the Institute of Field and Vegetable Crops on the world map of agricultural science. Agricultural Education and Research Innovation along the New Silk Road play a major role in healthy food production and environmental preservation under cu-

urrent global circumstances. The aim of the forum is to meet the mentioned needs in order to find the tools to deal with environmental problems coupled with the increasing demand for food.

AGRICULTURAL SCIENCE AND TECHNOLOGY COOPERATION MODE IN CENTRAL ASIA

Wei Feng

Northwest Agricultural and Forestry University, China

I. Current Situation of Agricultural Resources and Development in Central Asia

The agricultural production potential of the five Central Asian countries is huge, its cultivated land is 123 million hectares, accounting for 8.69% of the world, the per capita cultivated area is 0.86 hectares, about 8 times that of the northwest of China. They are mainly engaged in planting and animal husbandry and cotton, wool, silk and wheat have a significant influence in the world. But due to insufficient capital and technology investment, the five countries in Central Asia are lagging behind in agricultural production and some agricultural products are in serious shortage.

II. Agricultural Science and Technology Development in Central Asia

The five Central Asian countries are traditional agricultural countries, and the proportion of agricultural production is relatively high. Planting and animal husbandry are the two major agricultural production sectors in the five Central Asian countries, they are relatively advanced in technology. However, the occupation rate of agricultural machinery is low, and the mechanical equipment is seriously insufficient. Recent years, they have vigorously carried out agricultural scientific research and developed modern agricultural technology. However, due to the limitations of funds and talents, it still shows many shortcomings and backwardness in agricultural technology.

III. Modes of agricultural science and technology promotion in Shaanxi Province

Shaanxi Province has made some achievements in the promotion of agricultural science and technology. New agricultural science and technology promotion modes such as "NWAFU Mode", "Dali Mode", "Pingli Mode" and "Association Mode" have emerged, which has played a significant role in promoting and has a positive impact on the improvement of agricultural development in Shaanxi Province.

IV. Achievements of Silk Road Education Technology Innovation Alliance

On November 5th, 2016, 59 universities and research institutions from 12 countries responded to the initiative of our school and jointly launched the "Silk Road Agricultural Education Technology Innovation Alliance". After more than two years of development and improvement, the alliance has 76 member units from 14 countries now and the alliance has carried out a series of fruitful work in personnel training, scientific research, technology promotion, humanities exchange and think tank construction. The Silk Road Alliance has built four modern agricultural science and technology demonstration parks in Astana, Almaty, and Northern Kazakhstan in Kazakhstan and Bishkek in Kyrgyzstan; organized more than ten training courses; and under the framework of Silk Road Alliance, they established four sub-alliance, which has carried out a series of colourful activities in research cooperation, technology promotion, personnel training and humanities exchange.

V. Modes of Agricultural Science and Technology Cooperation in Central Asia

First of all, talent training mode, on the basis of the existing master's degree of the International College of Northwest A&F University, we will strive to set up special scholarships for the students of Central Asian countries, and train more outstanding doctoral students for Central Asian countries, and train agricultural science and technology talents in all aspects at the same time. Secondly, agricultural demonstration park mode, relying on the existing conditions of the university and Yangling Demonstration Zone, the Central Asia Demonstration Park will be planned, promoting the development of modern agriculture in Central Asian countries, solving the food security problems of Central Asian countries, and benefiting the Central Asian countries and all mankind. Thirdly, joint research center mode, focusing on the development strategy of rural and agricultural and common needs in Central Asian countries, we will establish the Joint Research Center for Modern Agricultural Science and Technology Innovation in Central Asia, carrying out basic and applied research in many fields, creating a high-level joint research center for agricultural science and technology with distinct characteristics and advantages, absorbing and condensing international outstanding agricultural scientific research talents, increasing the contribution rate of agricultural science and technology, promoting the high integration of agriculture education and research and sharing results among member countries. Last but not least, Industry-university-research mode, we will use the advantages of different innovation entities to carry out joint research, achieving the goal of innovation and transformation.