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CHINESE-BULGARIAN COOPERATION IN THE AGRICULTURAL SCIENCE – PRESENT AND FUTURE

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Abstract

Bulgaria, having established diplomatic relations with China for 68 years, is a key country and an attractive stop along the *Silk Road*. Nowadays *The Belt and Road Initiative* is a solid foundation for the advancing cooperation in education, science and technology, and cultural exchange between the two countries.

Besides rose oil, yogurt, and wine, China imports honey, bee products, processed meat, fruits, and vegetables from Bulgaria. The fruitful cooperation between the two countries can be further expanded in the field of agricultural sciences and agricultural engineering.

Initiated cooperation is based on the promotion of agricultural science and technology under strategic frameworks such as the *16+1* between China and Central and Eastern European Countries.

The latest development in the educational programs, fields of study, science, and internationalization, positioned the Agricultural University in Plovdiv, as a Center for the development of *The 16+1 Modern Agriculture Demonstration Park*, harmonizing the R&D and investment projects of different target groups.

Keywords: agriculture, cooperation, science, technology.

AGRICULTURAL SCIENCE IN BULGARIA

This paper presents the response to the “Belt and Road” initiative from the Agricultural University, Plovdiv as a national centre of agricultural science and education in Bulgaria, mainly in Agronomy, Horticulture Science, Plant Protection, Ecology and Environment Protection, Biological Farming and Agricultural Economics. Bulgaria is known as the country of roses and hospitality, of fruitful fields and traditional love to land and its fruits.

Bulgaria provides an end-to-end solution to developing the AgriFood sector because of the following specifics and prerequisites:

- Unique natural conditions for the cultivation of a wide variety of crops, Fruits and Vegetables;

- Ecologically clean and fertile soils; Very high quality of organic products (ban on GMOs);

- Established local producers and a strong tradition in the sector;

- Qualified human resources providing agricultural education and science with practical application; Long-standing distribution channels in the former Eastern Bloc;

- Very high health and environmental protection standards make Bulgarian products fully prepared to meet even the highest and most complex consumer requirements.

The growing demand for new and local foods in Europe and beyond will boost the need for promotion of traditional Bulgarian products, such as Rose oil, Lavender oil, fruits and vegetables, red and white wine, honey, peppers, meat, *Lactobacillus bulgaricus*, milk and dairy products, herbs and medicinal plants.

Agricultural Science in Bulgaria is realized by the Ministry of Agriculture, Food and Forestry to which belongs the Agricultural Academy with over 25 Research Institutes and 16 Experimental Stations throughout the country; and Ministry of Education and Science with the leading state-funded universities: Agricultural University – Plovdiv, University of Food Technology – Plovdiv, Trakya University – Stara Zagora, University of Forestry – Sofia, University of Russe.

AGRICULTURAL SCIENCE IN PLOVDIV REGION

Plovdiv is a city with ancient history, often referred to "The City of the Seven Hills." It could be also called "The Capital of the Agricultural Science" because on its territory are concentrated two universities – Agricultural University and University of Food Technology, and six main scientific agricultural institutions as Fruitgrowing Research Institute, "Maritca" Vegetable Crops Research Institute, Institute of Fishery and Aquacultures, Institute of Food and Canning Industry, Tobacco Research Institute – Markovo, Institute of Plant Genetic Resources – Sadovo.

The fertile lands in Plovdiv region preconditioned the cultivation of over 120 different agricultural crops. It was the basic reason for establishing the Agricultural University in the city. Agricultural University is the only specialized state-funded university in Bulgaria training specialists in all the areas of agriculture, environmental protection, rural development, agribusiness, and agro-tourism. The Agricultural University has a modern laboratory complex including Accredited Laboratory Complex for Testing, Central University, and Departmental Laboratories.

The major trends of the research are, as follows:

- Breeding, genetic and biotechnological investigations in the area of plant science, seed production and introduction.

- Establishment of advanced technologies in crop production.
- Conservation of the agrocenosis and soil protection.
- Animal breeding: in the area of genetics, breeding, and reproduction; physiology and nutrition of the agricultural animals.
- Economics, organization, business planning and economic evaluation of the land-use.

CHINESE-BULGARIAN COOPERATION IN AGRICULTURAL SCIENCE

In 2012, Wen Jiabao, the incumbent premier of China had a meeting with the state leaders for 16 Central and East European (CEE) countries in Warsaw, Poland, which contributed to the establishment of the '16+1' cooperation mechanism. From 2013 to 2016, Li Keqiang, the premier of China, has attended four meetings with the state leaders of 16 CEECs and the achievements covered several sectors including agriculture and science-technological innovations. The CEE countries take up one-fourth of the countries alongside the "Belt and Road." The countries as a whole are not only the link of the Eurasian exchanges and cooperation but also the important part for the global emerging markets as well as the new growth point of Eurasian trade. In 2015, Bulgaria, as the coordinator of agriculture for "16+1" cooperation, founded the Association of Promotion of Agricultural Cooperation between China-CEE Countries, for platform building and resources collection, fully contributing to the China-Bulgaria agricultural cooperation projects. □

Chinese-Bulgarian cooperation in the Agricultural University – Plovdiv dated since 2008-2009 with a Bilateral Project Bulgaria–China between the Departments of Genetics and Plant Breeding and the College of Horticulture of Shenyang Agricultural University. The further development of the cooperation was demonstrated by severe joint meetings, visits, and initiatives (Table 1).

Table 1. Joint meetings, visits, and initiatives

January 2016	MoU was signed between AU and Shanghai Jiao Tong University, during the visit of the Rector Prof. Grekov to China.
6 May 2016	A delegation of Beijing Municipal Government headed by Mr. Lin Keqing, Vice Mayor of Beijing, visited AU Plovdiv to push agricultural cooperation.
8-10 October 2016	The Rector and the Vice-Rector of AU attended the official ceremony at the Shenyang Agricultural University for signing the Agreement for cooperation in the area of education and research as part of the project “One Belt – One Road.”
5 April 2017	Official meeting with the Vice Minister of Agriculture Qu Dongyu, discussing future development of China - Bulgaria Agricultural Cooperation.
25 April 2017 □	A Memorandum of Understanding was signed between the Agricultural University – Plovdiv and the Association for the Promotion of Agricultural Cooperation between China and Central and Eastern European (CEE) countries (16+1).
22 May 2017	Deputy Minister of Agriculture of China Mr. Zhang Taolin visited AU – Plovdiv with an official delegation. Development of Joint Initiatives was discussed.
5 July 2017	First Sino-Bulgarian conference “FOOD and AGRICULTURE” was organized in AU- Plovdiv and 25 representatives of Chinese scientific and business institutions participated in the event. □
26 August 2017	Conference of APAC in the program of the International Expo “AGRA” Slovenia. It was confirmed that AU has the potential to be a Demonstration Centre for realizing "16+1" project by harmonizing the R&D and investment projects of different target groups.
18 September 2017	An official delegation from Shenyang Agricultural University, China, headed by the Rector Prof. Liu Guanglin, visited AU for discussing future joint projects and initiatives.
19 October 2017	The 3 rd Working Meeting of the China-CEE Association of Provincial Governors within the Cooperation China and the CEE countries (16+1) was held in Plovdiv with the participation of AU.
29 October – 4 November 2017	The Vice Rector, the Dean of the Faculty of Plant Protection and Agroecology, and the Director of the experimental field of AU visited Zhengzhou Fruit Research Institute. An Agreement between AU Plovdiv and ZFRI for development of Joint Laboratory for IPM was signed.

6 November 2017	Official visit of Prof. Cao Mengliang – Director of the China National Hybrid Rice Research Center, Hunan (HHRRC) and Dr. Pei Youliang, Dr. Wang Tiangkang and Dr. Zhu Hongjin in AU – Plovdiv, discussing a Joint Research Project for adaptation technology of hybrid rice cultivation in Bulgaria.
3-9 March 2018	An official Delegation of the APACCCEE with the participation of the Vice Rector of AU - Plovdiv visited Shenzhen Municipality, Beijing Genomic Institute, and China National Gene Banc for the realization of Joint Research Project “BGI Millet in Bulgaria.”
6-12 April 2018	The Rector and Vice Rector of AU – Plovdiv attended the 8 th World Women University President Forum in Wuhan, China, presenting the Joint China Bulgaria cooperation and initiatives. □
23-24 April 2018	China – Bulgaria Rural Revitalization Development Cooperation Forum was held in Sofia, organized by Shanghai Jiao Tong University, Agricultural University – Plovdiv, Institute of Agricultural Economics – Sofia and University of National and World Economy - Sofia
21-22 June 2018	Official visit of Prof. Zhang Yuzhu – Deputy Director of the China National Hybrid Rice Research Center, Hunan (HHRRC), Dr. Li Li – Deputy Director of International Cooperation, Dr. Shu Fu - Deputy Director of the Experimental Base and Dr. Li Yixing – research assistant in AU – Plovdiv. The scientists of both institutions discussed the details of the Joint Research Project for adaptation technology of hybrid rice cultivation and seed production in Bulgaria

Under the active support of the Department of International Cooperation of Chinese Ministry of Agriculture, the China National Hybrid Rice Research Center, Hunan (HHRRC) successfully applied for the test and demonstration project for hybrid rice in Bulgaria in 2007 and sent 20 rice varieties to Bulgaria for cultivation tests.

In November 2017, the HHRRC dispatched a team of experts to Bulgaria, which expertly guided the cultivation and trained agricultural technicians.

During this visit, the HHRRC signed a memorandum of cooperation respectively with the Association for the Promotion of Agricultural Cooperation between China and CEE countries and the Agricultural University of Plovdiv, Bulgaria.

The memorandum clarifies the future directions of cooperation. The introduction of hybrid rice will significantly boost the rice yield and economy in Bulgaria and promote the rice trade within the EU. The successful demonstration in Bulgaria will be a strong driving force for the proliferation of hybrid rice technique across Europe.

As result of the cooperation with Chinese partners, five young scientists from AU attended specialized courses and seminars in Chinese Universities and research Institutes with the kind assistance of the Embassy of China in Sofia.

Additionally, one Joint Research project was successfully evaluated, and three new Bilateral Research Projects have been prepared for submission.

CONCLUSIONS

Based on the international experience, the expertise of qualified staff, research and experimental fields with reach biodiversity of crops, AU – Plovdiv was selected as a Center for Demonstration of Innovations and New Technologies in Agriculture within "One Belt - one Road" and "16+1" partnerships.

The further development of Joint projects with the partners from Bulgaria and China is towards Agrofood biotechnologies, Biologically active substances, Molecular biotechnologies, Sustainable agro-ecosystems and plant protection, Adaptation of crops to climate change and environmental pollution, Biodiversity and Plant Genetic Resources, and Digitalization in the Agriculture.

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