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Article

In The Framework of External Cooperation, Modernized Laboratories and High-Yielding Wheat Varieties Should be Introduced

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Abstract: In recent years, innovative approaches, scientific and technical achievements and international cooperation have been gaining special importance in the development of agriculture. In particular, the modernization of modern agricultural laboratories and the introduction of high-yielding wheat varieties within the framework of projects implemented with foreign partners in Samarkand, Bukhara and Navoi regions serve to increase productivity and ensure food security. This once again confirms the effectiveness of implementing scientific approaches in agriculture.

Keywords: Zarafshan oasis, Samarkand, Bukhara and Navoi, Agriculture, grain varieties, project, international cooperation, laboratory

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1. Introduction

The introduction of updated laboratories and high-yielding wheat varieties within the framework of external cooperation has created an opportunity for the widespread application of scientific approaches in agriculture, creating the basis for the sustainable development of the industry [1].

As is known, one of the most important issues facing countries around the world today is ensuring food security for the population. Of course, in the context of sharp climate change, it is necessary to adapt agriculture to this climate, improve selection and seed production, and use a new approach to agricultural technologies for the cultivation of agricultural products. Currently, more than 60 percent of the population of the Republic of Uzbekistan lives in villages [2]. The main factor in improving the social situation of the population living in villages and increasing their income is the modernization and diversification of agriculture, providing the population with essential food products, which is an urgent task, and is one of the important sectors of the economy of the Republic (44 percent of national income is agriculture). This sector, while satisfying the population's demand for food products and the processing industry's demand for raw materials, is also one of the promising sources of strengthening export potential [3]. From the time the Republic of Uzbekistan gained independence to the present day, the Zarafshan oasis has occupied leading positions in the republic in various sectors of agriculture, based on its natural potential [4].

2. Materials and Methods

The works devoted to the history of international relations of Uzbekistan include the books of N. Tokhliyev, A. Toqsanov, A. Rasulov and others. Using materials from the national and local state archives, periodicals and popular scientific publications, the essence of the selected problem is revealed. In the process of studying the introduction of updated laboratories and high-yielding wheat varieties within the framework of external cooperation, economic, logical, scientific abstraction, induction, deduction, dynamic study, comparative analysis and other methods were used.

Due to the fact that in 1990 more than 46 percent of the investments in agriculture in the Zarafshan oasis were financed from the budget, extra-budgetary funds and other centralized sources, an inter-district agro-trade company was established in the Zarafshan oasis. By the end of December 1991, the company had supplied the population of the remote districts of the oasis with products worth 300 thousand soums (in 1991 monetary values - dissertation). The agro-trade company also supplied a large number of fruit, vegetable and grape products to the miners and builders of the cities of Zarafshan and Uchkuduk, as well as to the workers of the Perm region of the RSFSR.

As a result of a number of changes to the tax system and a reduction in the value-added tax in order to develop agriculture, farmers and farms in Bukhara region benefited by 23 billion soums, farmers and farms in Navoi region by 16 billion[4], and farmers and farms in Samarkand region by 28 billion soums. The situation in the agricultural sector improved somewhat due to the provision of preferential loans to farmers and farms several times. In addition, the modernization of the material and technical base of agriculture was an urgent issue. In this regard, in particular, in order to implement the resolution of the Bukhara regional administration No. 40 dated February 10, 1995, measures were determined to strengthen the material and technical base of the regional agricultural complex and were communicated to the relevant organizations and district governors. All types of agricultural machinery available at enterprises and organizations were re-registered. Technical inspections were carried out and 1,339 tractors and agricultural machinery that were physically obsolete and unusable were written off.

3. Result and Discussion

In exchange for ten thousand tons of fiber separated from the 1994 harvest, 113 tractors worth 71 million 810 thousand soums, 216 sawmill tractors worth 70 million 31 thousand soums, 58 grain combines worth 45 million 149 thousand soums, 25 cargo tractors worth 11 million 250 thousand soums, 727 tractor trailers worth 36 million 95 thousand soums, 15 earth-moving machines (excavators) worth 16 million 905 thousand soums, 11 cargo vehicles worth 5 million 148 thousand soums, fuel trucks worth 7 million 70 thousand soums, agricultural machinery worth 22 million 351 thousand soums, 3 million 169 tons of metal and hardware worth 35 thousand soums, spare parts worth 150 million 881 thousand soums, 3925 batteries worth 19 million 124 thousand soums, 3812 tires for cars worth 17 million 155 thousand soums, and farm goods worth 40 million 928 thousand soums were imported and delivered to the farms of the Zarafshan oasis [5].

In 1994, by the decision of the Bukhara regional governor, the "Xalqobod" collective farm was fully specialized in grain seed production. This farm planted 330 hectares of "Intensive" grain and maintained it well [6]. In May 1995, a field approval was conducted and the fields were completely cleared of weeds. Since weed seeds can grow in other fields if they are mixed with grain seeds, measures were taken to improve the quality of the seeds by clearing the fields of weeds. Instead of the planned 32 centners, the Khalqabad farm expected to yield 35 centners per hectare [7]. This means that instead of 1200 tons, it was planned to get 1350 tons of quality seeds. However, in the fall of 1995, no less than 2500 tons of seeds were needed to sow 9050 hectares of winter grain crops in the farms of the Romitan district. Therefore, it was planned to collect seeds from the "Sanzar-4" and "Sanzar-3" varieties planted in other farms [8]. In order to improve the quality of seed wheat in the Bukhara region, one of the main crops in Hungarian agriculture is winter wheat (winter wheat is called autumn grain in Bukhara -diss.). Its growing season lasts from October 20 to November 20 every year. Due to the specific characteristics of the Hungarian agroclimate, this country is humid (high humidity, low transpiration coefficient compared to the amount of precipitation). Therefore, seed treatment is carried out here before sowing [9].

The sowing scheme is quite different from the Bukhara region, i.e. it is sown to a depth of 3-4 cm (in Bukhara, 6-8 cm). The reason for this, as I mentioned above, is the high atmospheric precipitation and humidity (in Hungary, the average atmospheric precipitation is 500-600 mm/year, in Bukhara this figure is almost twice as low, i.e. 250-300 mm/year), which is why special treatment of seeds is necessary, because due to the high humidity, this practice (special treatment of seeds) is very necessary. Otherwise, ordinary seeds may rot, become prey for various types of pests or suffer from various diseases [10].

The special practice includes 3 stages, which are as follows.

1. The process of sorting seeds (depending on the variety).

2. Passing seeds through a special sieve, during which seeds that have been crushed or damaged during harvesting are considered unsuitable for planting [11].

3. Seeds are mixed with chemicals that contain a special mixture of fungicides and herbicides. After sowing, soil samples are taken from the field for seed control: Adapting the Hungarian agricultural experience to the climate of the Bukhara region, and implementing the above-mentioned practice (special seed treatment) on a large scale in the region, the quality of seed grain has increased [12]. In addition, in the fields of the region, wheat varieties such as “Polovchanka”, “Kroshka”, “Krasnodar-99” were popular with grain growers due to their suitability for local climatic conditions. The farms “Shukur Tokhta” in the Gijduvan district, “Nasimbek” in the Romitan district, “Navruz Ziyo” in the Jondor district, and “Jumagaldi” in the Olot district yielded 75-80 centners per hectare [13].

The development of foreign relations has yielded results in improving selection work. By the decision of the governor of the Samarkand region, all farms in the Tayloq district were converted into grain seed farms. The “Elita” enterprise, an Uzbek-Irish joint venture, began its work. The “Ulugbek-600” variety created in the region attracted the attention of farmers of the republic due to its early maturity, disease resistance, and productivity [14].

In 2001, as a result of scientific research conducted by scientists from the Scientific Research Institute of Karakul Farming and Desert Ecology of Uzbekistan in Samarkand in collaboration with colleagues from Syria, Jordan, Egypt, and Turkey [15], varieties and lines with high grain quality indicators, super early ripening, resistant to saline soils, drought and heat, as well as diseases, were created. In the southeastern Zarafshan oasis, researchers zoned the soft wheat varieties "Turkiston", "Jaykhun", and "Yaksart". As a result of the development of external relations, in 2010 the early varieties of soft wheat "Hazrati Bashir", "Elomon", "Hisorak" and "Rozgon" were created, and in 2011 the high-yielding variety of durum wheat "Nasaf" and 185 combinations of different varieties were crossed, creating hybrid lines of salt-resistant wheat varieties [16].

The establishment of international relations was also a prerequisite for improving the selection of cereal crops. Scientific research was conducted with the international scientific centers Simmit in Mexico and Ikarda in Syria on the creation of wheat varieties resistant to drought and water shortage in hot countries, and cooperation was established with the University of Sydney in Australia on the project “Creation of wheat varieties resistant to rust diseases” and with the University of Bonn in Germany on the project “Creation of wheat varieties resistant to salt” to exchange and provide mutual selection achievements and resources, as well as train young specialists. The results of the experiments carried out on the introduction of new varieties were clearly visible in the increase in productivity. For example, in 2001, the average grain yield in the Zarafshan oasis was 32 centners per hectare, but by 2008 this figure had reached almost 47 centners. As a result, the volume of gross grain production by region increased from 750-800 thousand tons in 2005-2008 to one million tons in 2009. More than thirty new high-yielding, early-ripening varieties such as "Chillaki", "Zamin-1", "Bobur", "Do'stlik", "Mars-1", "Marjon", "Andijan-2", created as a result of scientific research conducted by breeders, made it possible to further increase productivity in grain production [17].

The grain growers of Navoi region were assigned 79,700 tons of grain to the receiving points, but in reality 79,722 tons of grain were transferred to the state, and the plan was fulfilled by more than 100 percent [18]. Grain growers of Navoi, Navbahor, Kyzyltepa, and Khatirchi districts made a special contribution to the achievement. The agricultural firm “Do‘stlik” in Navoi district, the farms of the Kadir Rakhimov “Zarafshon” partnership, the farms of “Yangiqurg‘on” and “Navoiy” in Navbahor district, “Toshrabot” and “Vorozun” in Kyzyltepa district, and the farms of the “Navoiy” partnership in Khatirchi district produced 200,000 tons of selected grain at a yield of 45-

70 quintals per hectare[19]. The regional grain fields were planted with high-yielding, climatically suitable varieties of "Kroshka", "Nota", "Tanya", "Moskvich", "Bobur"[20]. The above-mentioned variety of wheat varieties created in the Zarafshan oasis was distinguished by its adaptability to soil, climatic and water conditions in all regions of the republic. This, of course, improved the social situation of the population of the republic and served to satisfy the population's needs for bread and food.

The laboratory for genetic diagnostics of plant diseases established in the Zarafshan oasis was equipped with the most modern equipment. The laboratory, using gene markers, allowed for express genetic diagnostics of diseases of cultivated and imported wheat and other cereal crops, and for the rapid detection of new diseases in a few hours. However, using microbiological methods, this would have taken 4-5 days. Transgenic varieties of cereal crops resistant to diseases were created in the laboratory [21]. The location of such laboratories, aimed at developing agriculture in the Zarafshan oasis, shows that agriculture in the Zarafshan oasis has been developing year after year.

4. Conclusion

Based on the above evidence, it can be said that the Zarafshan oasis occupies a special place in the agriculture of Uzbekistan. Based on the climatic and soil conditions of the oasis, systematic approaches have been implemented in the areas of modernization, diversification of agriculture, selection and seed production. In particular, the decisions taken since the 1990s, preferential loans, strengthening of the material and technical base, and the establishment of agro-industrial enterprises have served to increase the volume and quality of agricultural products.

The use of tax breaks by farmers and farms operating in the Bukhara, Navoi and Samarkand regions ensured their economic stability and allowed them to increase productivity. In particular, the practices carried out on the quality of seed grain - the introduction of selection, seed processing technologies, and the adaptation of Hungarian experience have yielded positive results. New varieties, such as “Polovchanka”, “Kroshka”, “Krasnodar-99”, “Bobur”, “Ulug’bek-600”, “Chillaki”, “Turkiston”, “Hazrati Bashir”, “Rozg’on”, “Nasaf”, which are highly productive and adapted to climatic conditions, have significantly increased productivity.

In addition, international scientific cooperation has brought the selection process to a qualitatively new level. In cooperation with countries such as Australia, Germany, Mexico, and Syria, varieties resistant to water scarcity, salinity, and diseases have been created and successfully adapted to the agro-ecological conditions of the Zarafshan oasis. New technologies, in particular, the activities of genetic diagnostic laboratories for the detection of plant diseases, have served to harmonize agriculture with science.

Thus, as a result of the comprehensive measures taken in the Zarafshan oasis, scientific research, exchange of external experience, and support provided by the state, various sectors of agriculture have developed rapidly. This has been an important factor not only in ensuring food security, but also in achieving national economic stability.

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