

HISTORY OF THE ACTIVITIES OF AGRICULTURAL EXPERIMENTAL STATIONS IN TURKISTAN (EARLY 20TH CENTURY)

Narziyeva Maftuna Adxamovna,
NavDU Doctoral Student,
0009-0002-2053-8900
maftunanarziyeva1522@gmail.com
+99890 732-24-72

Abstract

This article provides reflections on the activities of agricultural experimental fields operating in the Turkestan region during the period of the Russian Empire.

Keywords: Experimental field, greenhouse, vegetable, orchard, fruit seedling, bed, beekeeping, productivity, shabdar, tomato, cotton farming, English bed, French bed, new techniques, labor tools.

Introduction

The Turkestan Agricultural Society (TQXJ), established in 1885, organized the Department of Dry (Steppe) Agriculture (Отделение сухого земледелия), under which the Central Turkestan Experimental Station, experimental fields, and trial plots were established between 1902 and 1907.

The Experimental Station, founded in 1898 near Chimkent in the Tashkent province, approximately 12 km away from Tashkent, coordinated the activities of the experimental fields and trial plots from the center. It also conducted laboratory and scientific investigations related to dry land farming, primarily in the dry areas, along with observations and research. There were routes for dry land farming in the vicinity of Tashkent city, specifically in Chimkent and Avliyota districts.

Results from field experiments conducted on the experimental fields were summarized, while studies on crop yields and adaptability to local conditions at the trial plots were carried out through laboratory and experimental verification.

Review of Related Literature: The research primarily analyzes data stored in the funds of the Uzbekistan National Archives, articles published in the Turkestan Agriculture Journal, and works by scientists and researchers active during that period and involved in Turkestan's agricultural society. Notably, this includes studies by scientists such as A. Shaxnazarov, A. Muxin, M. Bushev, and Lyukern.

Research Methodology: The study employed historical objectivity, systematization, and statistical analysis methods effectively.

Analysis and Results: The experimental fields possessed their own land funds and were used for testing and acclimating cotton and other crop varieties, creating fruit and ornamental tree



nurseries, determining water consumption for each planted crop, applying mineral fertilizers, conducting meteorological observations, combating plant diseases, and introducing new techniques and machinery into agriculture.

The experimental fields and stations were planned to be established in five provinces of the Turkestan Governor-Generalship: Sirdarya, Fergana, Samarkand, Yettisuv, and Caspian-Orti, totaling five experimental fields and five experimental stations.

Budgets allocated for equipping these stations, fields, and plots, as well as annual expenses, were also defined. Specifically, 2,500 rubles were allocated for station equipment, with annual expenses estimated at 117,000 rubles. For the experimental fields (Ashxabod, Jizzakh, Juwali, Kōgirt), 60,900 rubles were allocated for equipment, with annual expenses of 24,000 rubles. Each state experimental site was assigned a supervisor, with five supervisors receiving salaries ranging from 2,000 to 10,000 rubles. On average, 8,000 rubles were allocated for equipment per site, with annual expenses of each site around 6,000 rubles. In total, 93,900 rubles were spent on establishing and equipping the experimental station, fields, and plots, with an estimated annual expenditure of about 41,700 rubles[1].

The experimental fields operated in Andijan, Dasht Chöl, Ashxobod, Kopal, and Jizzax. In 1907, during five meetings of the TQXJ (on January 13, 16, 20, 23, and February 12), decisions were made to establish experimental fields and stations in Kushka, Jizzax, O'ratepa, northeast of Tashkent, Avliyota district, and the Ko'girt valley of Andijan district. It was also decided to allocate 15,000 rubles for these purposes and to ensure that the land plots for the experimental stations were no smaller than 100 desyatins (about 1 hectare) [2].

Furthermore, the construction of laboratory buildings and the increase in the number of laboratory staff to two individuals were prioritized to facilitate comprehensive laboratory work at these stations.

Among the various experimental fields, the activity of the Dasht Chöl experimental field is confirmed by historical evidence to have been particularly effective. Although this experimental field was established relatively later, the scientific experiments carried out there proved to be significant.

In 1908, at the Dasht Chöl experimental field, two-year and seven-year seed varieties of English, recommended by TQXJ, and local Turkestan varieties were compared and tested. The yield from the English variety was 125 puds per desyatina in the second harvest, compared to 75 puds from the Turkestan variety. The English variety was also more resistant to pests and insects, producing 30 puds on pest-infested land, whereas the Turkestan variety yielded 14 puds. The French variety, which was also pest-resistant and adapted to the natural climate of Turkestan, showed promising results.

According to the trial results, the height of the English variety was 17 vershoks (where 1 vershok = 3.5-4 cm), while the Turkestan variety was 15.5 vershoks. These two seed varieties differed in the retention of their flowers, branches, and stems: after two years, the English variety preserved 33% of its stems, while the Turkestan variety preserved 19%. The weight per stem was 145 grams for the English variety and 72 grams for the Turkestan variety. The number of flowering branches was 10 for the English variety and 6 for the Turkestan variety, with the number of seeds corresponding to a ratio of 9 to 6, respectively.

Valuable scientific results were also obtained from experiments on fodder crops in the Dasht



Chöl experimental field, as well as from crop rotation experiments involving cotton and other crops [3]. Particularly notable were the experiments conducted on the “Shabdar” (night bed) introduced from Mashhad province in Iran, led by the head of the Dasht Chöl experimental field, M. Bushev.

Seeds of 1-year, 2-year, and 5-7-year varieties were brought to the experimental fields. In early March (3–5 March), for one desyatina of land, one pud (approximately 16 kg) of bed seed was sown at a rate of 1 pud and 10 pounds per desyatina. The seeds were harvested five times during the year. The harvest yields per desyatina were as follows: in the first harvest, 14 pud 17 pounds were obtained from 25 square gaziks (a local measurement), amounting to roughly 1,300 puds; in the second harvest, the ratio was 12 pud 12 pounds; and in the third and subsequent harvests, approximately 6 pud 1 pound and 550 puds were harvested [4].

After drying, the Shabdar retained one-fifth and one-quarter of its weight. When semi-dried, from one desyatina of land, the first harvest yielded 230 pud, the second 185 pud, and subsequent harvests approximately 95 puds of bed material.

Scientific observations from 1908-1910 at the experimental field indicated that for Shabdar, the heat requirement was approximately 1310 calories, and the plants needed twice the nourishment of local varieties. It was shown that intercropping with crops such as sesame, tartar, autumn wheat, and barley (excluding cotton) was effective, and planting between garden rows was also beneficial.

On 10 March 1907, seed varieties of French radishes and esparsetto were tested, which showed high yields over 3–4 years and served as nutritious fodder for livestock. The French radish varieties, which were pushtirang (pink) and red-flowered, attracted many bees and produced abundant nectar.

In 1908, trials of Klevar (Russian red radish) and Timoreevka, Rebrika varieties, were conducted on plots of 0.5 desyatins, with results showing their suitability for the local climate. In 1911–1912, various vegetable trials were conducted in Dasht Chöl, including peanuts, goatbeans, black zucchini, black melons, sugar beets, and livestock fodder crops such as Ekkendorf, Slava, Enkogoy, and Egyptian tomatoes like “Atta” and “Khojand,” as well as “Kral Blubert” and Michigan vegetables [5].

Additional vegetables such as bell peppers, cabbage with pods, celery, and two varieties of radishes were grown and tested in the “Vegetables” section. Among these, the Egyptian “Atta” cucumber variety, which resembled a bright green gourd, was successfully tested and distributed to nearby farms.

A greenhouse was used to grow 12,000 foreign tomato seedlings, of which 2,000 were sold to farms, with each receiving two copies. In 1912, the experimental field sold tomatoes worth 124 rubles and cabbage seedlings worth 75 rubles, totaling 199 rubles.

The tested tomato varieties included “Fikarasin,” “Borize,” “Elbert,” the “Monarx Astraxansky” watermelon, the “New-York” eggplant, “Kardinal” pepper, Russian onions, garlic, and Egyptian leeks. Alongside the vegetable department, the orchard section also carried out important work. There were nursery sections (seedbeds), young fruit orchards (up to 4 years), and old orchards (over 10 years). Hundreds of fruit trees of different varieties were cultivated. Among the young orchards, apple varieties such as Sari-Sinap, Bel-Fler, Boyken, Renat Simirenko; pear varieties like Jozefeno, Mixelenskaya, and some pear trees named “Karlik” (small); and others like Renet



Shampanskiy, Renet Simerenko, Belvil-Rosemary, Bel-Fler, Kalvin, and Belyi Zimniy were grown and tended.

In mature orchards, varieties such as Knyajskoe Zimnoy, Boskopskaya Krasavitsa, Rayke, Bere-Ardanchan, Bere-Ligel, Bere-Sanya, Linkolnskaya, Zimnyaya Tayushaya Tiropl, Krasavitsa de Arbr, Forel, Jozefina, Mixelenskaya, Mushmulla, Hollandskaya, Korolevskaya, Noggenem, and sweet apple varieties were cultivated and tested [6].

During 1912–1913, the Dasht Chöl experimental field participated actively in fairs and exhibitions in Tashkent, Saint Petersburg, and Moscow with exhibits from the “Vegetables,” “Beekeeping,” and “Scientific Publications” sections.

The vegetable section showcased a variety of crops, including cabbage varieties “Slava-Enggoy,” “Oq Boshli” (White-Headed), Bulgarian cabbage, Egyptian flowers, and tomato varieties “Michigan,” “Korel Gumbert.” It also presented local cucumbers from Khjand, “Atta” Egyptian cucumbers, white and red radishes, and kitchen onions, Egyptian onions, black gelatinous onions, potatoes, yellow and red carrots, and cumin seeds. Additionally, celery, vegetable seed collections, and other vegetables were displayed [7].

Displays included honey of various shades stored in frames and jars, as well as different types of nectar-producing cotton flowers, along with dozens of nursery varieties of fruit and ornamental trees.

This part presented booklets and manuals dedicated to the condition of gardens and vegetable fields, techniques for processing vegetables, yield results, soil and soil composition analyses, and various diagrams.

The Dasht Chöl experimental field was awarded a small gold medal in the 1913 exhibition for achievements in fruit growing, and a large silver medal for success in vegetables and vegetable growing. Over several years, the soil composition of non-irrigated (desert) lands was studied at the Dasht Chöl experimental field. The efficiency of increasing yields through soil fertilization was determined.

Research showed that on one desyatina of cotton land, an average of 100 pud (about 1,600 kg), 55-70 pud of maize, 800-1000 pud of potatoes, 75 pud of peas, 55 pud of sorghum, 75 pud of cumin, 80 pud of sesame, and up to 55 pud of rice could be obtained with the use of 130 pud of mineral fertilizer. The average yield increase per desyatina was found to be between 17 and 25 poods [8].

Trials of tomato varieties such as Trodi, Koloss, Mikado, Chudo Rinkal (“Bazaar Miracle”), Spares Irliana, and “Korel Gumbert” were conducted based on soil and land preparation methods. Further experiments included rotating vegetables and field crops with manure application. In the first year, cabbage and potatoes were grown; in the second, tomatoes; and in the third year, cucumbers, watermelons, and melons. Over four years, 10 different crop varieties were tested on one plot, examining traits like color, weight, moisture content, sweetness, acidity, flavor, fruit firmness, skin thickness, and shelf life [9].

Descriptions of apples, pears, peaches, cherries, and apricots emphasized large, transparent, shiny appearance, attractive external look, blemish-free quality, long storage life, and delicious taste [10].

In the regions and experimental plots of Turkestan, particular focus was placed on cotton seed testing—both local and imported varieties. The Andijan experiment field, established in 1900,



was originally called the “Andijan Cotton Experiment Field” and tested local seed varieties (blue, white, black seeds), Bukhara and Khorezm cotton seeds, along with numerous American upland cotton varieties.

Over time, the scope expanded: in 1904, an orchard of apple, pear, and apricot seedlings was established; in 1906–1907, a pear orchard; and in 1911–1912, a fruit nursery with thousands of seedlings of apples, pears, peaches, apricots, cherries, and grapes. In total, thousands of seedlings were grown and tested: 14 seedlings of apple and pear in 1904, 59 seedlings in 1906–1907, and 8 seedlings in 1908–1909.

In 1911–1912, the nursery had about 12,000 varieties of apple, pear, peach, apricot, cherry, and grape seedlings, some of which were tested for winter hardiness, disease resistance, pest tolerance, and yield efficiency. In 1908–1910, the Andijan experimental field sold fruit seedlings (apples, pears, peaches, apricots, cherries, grapes), earning revenue: 37 rubles 50 kopecks in 1908; 120 rubles 17 kopecks in 1909; and 145 rubles 49 kopecks in 1910 [11]. At the Dasht Chöl experimental field, foreign cotton varieties “King” and “Ops Von” were tested over 7–8 years. Efforts were made to cross local varieties with wild cotton to obtain hybrid strains [12].

Near the Andijan experimental field, the Tashkent Technical Warehouse section was established in 1905. Special attention was given to providing farmers in the Fergana region with plows, planting, harvesting, and transportation equipment, as well as tools for drying fruits and fighting pests. The warehouse stored equipment such as the Aksoy plow, the Brichka (wheelbarrow), the “Dirint” plowing machine, Lithuanian plows, molotilka (grain mills), labogreyka (a type of sieving device), and tula hoes [13]. These machines were manufactured in factories of the Russian Empire and imported from abroad, often exceeding the purchasing power of local farmers. Despite this, the warehouse played an important role in introducing modern, new techniques to peasant farms.

In the Turkestan region, experimental stations tested tobacco varieties such as “Qalmoq,” “Qalay,” “Kok,” and “Oq” (white). Imported varieties like “Duibie,” “Makarka,” and American “Virginia,” as well as Greek “Marilend” and “Ogayo,” were also trialed. Tobacco varieties sent from experimental stations, especially in the Samarkand and Fergana regions, and in Tashkent, were cultivated on about 1,000 desyatins (around 10,000 hectares) [14].

While conducting experimental trials with local and imported crop varieties, the control units of the Turkestan region monitored market prices and economic indicators regularly. Reports and articles from the managers of the experimental fields contain information about the prices of wheat, barley, millet, rice, corn, apples, pears, peaches, apricots, vegetables, and fodder crops. Particularly, the fluctuations in grain prices are evaluated per pud (local measure). For example, between 1908–1911, the price of white wheat ranged from 77 to 85 kopecks per pud; red wheat from 75 to 90 kopecks; millet from 90 kopecks to 1 ruble 10 kopecks; barley from 73 to 75 kopecks; millet (tariq) from 1 ruble 80 kopecks to 2 rubles; corn from 72 to 80 kopecks, and fodder (mogar) from 50 to 60 kopecks [15].

Summary and Recommendations:

In conclusion, in the early 20th century, the development of agriculture in Turkestan was significantly supported by experimental fields and stations. These platforms played a crucial role in testing new plant varieties, recommending suitable crops to farmers, and distributing improved



seeds and technologies across the region.

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