JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 10, October 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

INNOVATIONS IN COTTON CULTIVATION AND AGROTECHNICAL SYSTEMS IN THE TASHKENT AND SYRDARYA REGIONS IN THE 1950S.

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Annotation: This article analyzes the innovations in the cotton cultivation and agro-technical systems introduced in the Tashkent and Syrdarya regions during the 1950s, as well as their impact on productivity and the efficiency of cotton growing. Based on archival documents, agrarian policy materials, and scientific sources of that period, the study examines advanced practices in cotton production under the Soviet era — including seed selection, sowing norms, irrigation, crop maintenance, and mechanization processes. The paper highlights experiments conducted in the Syrdarya region from 1954 onward, where cotton seedlings were grown in humus-soil pots before being transplanted to open fields, and the testing of new cotton varieties in the Tashkent region aimed at improving agro-technical methods. The findings conclude that the 1950s marked a period of technological innovation and modernization in Uzbekistan's cotton cultivation system.

Keywords: Tashkent region, Syrdarya region, cotton, agrotechnics, mechanization, irrigation, cotton growing, 1950s.

The 1950s marked a period of significant transformation in Uzbekistan's agriculture, particularly in the cotton industry. In the post-war years, issues such as restoring the national economy, increasing cotton yields, and improving cotton cultivation technologies were elevated to the level of state policy. Consequently, many advanced collective and state farms (*kolkhozes* and *sovkhozes*) in the Tashkent and Syrdarya regions became centers for testing new agrotechnical practices.

Taking into account that cotton seeds usually sprouted after the first irrigation and that among them were weak plants with low productivity, in 1954 the *Okhunboboyev* Collective Farm in the Syrdarya region introduced an innovative practice: replanting the areas where sprouts had failed with cotton seedlings grown in humus-soil pots inside cold greenhouses. This method not only helped stabilize yields but also accelerated the initial growth phase of the plants. Later, this experience spread to other farms in the region, stimulating the scientific planning of both seed sowing and transplanting processes.

Additionally, in several collective farms of the Tashkent region, the method of machine-based cluster sowing of cotton seeds became widely adopted. In this approach, a slightly larger quantity of seeds was planted than the optimal number of plants required for high yields. The aim was to ensure dense germination and later thinning to leave only the strongest and healthiest cotton plants. As a result, the root systems of the plants developed more robustly, leading to stable and increased productivity.

In the mid-1950s, progressive agrotechnical methods were introduced in cotton cultivation at the *"Sharq Yulduzi"* (Star of the East) Collective Farm in the Oktabr District of the Tashkent region. Among these innovations were narrow-row planting, square-nest arrangement of cotton plants, and the mechanized longitudinal and transverse cultivation of inter-row spaces. In 1954, cotton

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was cultivated on 800 hectares of land using these new methods. As a result, labor costs in cotton care decreased by 45 percent, while productivity increased significantly.[1]

In addition, the workers of the *"Sharq Yulduzi"* Collective Farm conducted scientific observations to determine how fertilizer application timing affected the maturation process of cotton. Their findings revealed that when fertilizers were applied too late, although the total yield increased, the ripening of the cotton was delayed, leading to a higher proportion of "green cotton" (unripened bolls). Consequently, in subsequent years, mineral fertilizers were applied on time, in accordance with the vegetative stages of cotton growth.

Experiments conducted at the *"Oktabr 40 Yilligi"* (40th Anniversary of October) Collective Farm in the Boka District during the 1950s demonstrated that the most favorable conditions for sowing cotton seeds occurred when soil temperatures reached 14–16 °C and air temperatures were 12–14 °C. This typically corresponded to the period between April 10 and 20. Considering that seeds sown too early were vulnerable to frost, while those sown too late led to prolonged vegetation and delayed harvests, this timeframe was established as the most optimal period for sowing from an agrotechnical standpoint.[2]

The Relationship Between Thinning and Yield Quality

Thinning (*yaganalash*) of cotton was considered one of the most crucial agrotechnical stages in cotton cultivation during that period. Scientific experiments demonstrated that thinning should be performed when the cotton plant has developed one or two true leaves, without delay. Late thinning negatively affected the development of the root system and overall yield. According to data from the *Paxtaorol Experimental Station* of *SoyuzNIHI* (the All-Union Cotton Research Institute of Uzbekistan, located in the Syrdarya region), delaying the thinning process by six days resulted in a 12–15 percent reduction in yield.[3]

According to the agrotechnical standards of that time, the following plant densities were recommended for obtaining early-maturing and high-yield cotton varieties:

- On fertile soils — 90–100 thousand plants per hectare,
- On moderately fertile or slightly saline soils — 100–110 thousand plants per hectare,
- On poor soils — 115–130 thousand plants per hectare.

These norms were determined based on the soil's water permeability, nutrient content, and mechanical composition.

According to data from the Tashkent Regional Department of Agriculture, in the *Mirzachul District* collective farms, the density of cotton plants per hectare was 72.3 thousand in 1955 and 76.5 thousand in 1956. In the Syrdarya region's farms, these figures increased from 78.6 thousand plants per hectare in 1955 to 85.2 thousand in 1956. This growth reflects the rise of scientific approaches, mechanization, and improved agrotechnical culture in cotton farming.

Mechanization and Labor Productivity

From the mid-1950s onward, mechanization became widely introduced in cotton cultivation. Between 80–85 percent of cotton fields planted in a square-nest pattern and cultivated both

[1] Ashurmetov I. Mo`l paxta hosili yetishtirish tajribasi. Toshkent: O`zbekiston, 1981 y. 3 p.

[2] Ashurmetov I. Mo`l paxta hosili yetishtirish tajribasi. Toshkent: O`zbekiston, 1981 y. 6 p.

[3] Gavrilenko D.M. Mirzacho'lda g'o'za o'stirish. Toshkent: O'zbekiston SSR Fanlar akademiyasi, 1957. 29 p.

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longitudinally and transversely by machinery were fully mechanized. In fields where cultivation was carried out only longitudinally, this figure was about 50–55 percent, which reduced the need for manual labor by more than 1.5 times.

In 1956, the *Molotov Collective Farm* in the Gulistan district implemented two-directional mechanized cultivation on 1,000 hectares of cotton fields. As a result, the farm saved 135,000 labor days in cotton production. While in 1955, cultivating one hectare of land required 199 labor days, and producing one centner of cotton required 7.2 labor days, in 1956 these figures dropped to 161 and 5.6 labor days, respectively. This reduction, in turn, led to lower production costs, a decrease in the cost price of cotton, and a significant increase in labor productivity among collective farm workers.

During this period, the number of machine operators (*mekhanizators*) in the agricultural system of the Uzbek SSR steadily increased, accompanied by a sharp rise in the number of tractors and cultivators. By 1955, the number of agricultural machines used in cotton cultivation in the Tashkent and Syrdarya regions had increased 2.3 times compared to 1946.

At the *"Paxtaorol"* state farm (*sovkhoz*), experiments on sprinkler irrigation of cotton fields using DD-A-100m and DM-100 model machines were conducted over several years. For instance, in 1957, sprinkler irrigation was applied to 2,000 hectares of farmland at this farm.

The results of fertilization practices can be clearly observed through the example of advanced farms in the Mirzachul region. Between 1945 and 1954, data from the *"Paxtaorol"* state farm show a direct correlation between the amount of fertilizer applied and the increase in average cotton yield per hectare, as shown in the table below:[4]

Years	Average Fertilization (kg per hectare)		Average Cotton Yield (centners per hectare)
	Nitrogen	Phosphoric Acid	
1945-1947	91,4	38,4	23,2
1948-1950	152,7	106,9	27,9
1951-1953	139,2	146,3	28,7
1954	126,0	132,0	35,3

The improvement of irrigation networks, the mechanization of irrigation systems, and monitoring the reclamation (meliorative) condition of lands became crucial factors in stabilizing and increasing cotton yields.

Conclusion

Thus, the 1950s marked a new stage in the development of cotton cultivation culture in the Tashkent and Syrdarya regions. During this period, the scientific determination of sowing times, transplanting of seedlings, timely thinning, mechanized fertilization, and the introduction of agrotechnical methods such as square-nest planting all contributed to a significant rise in cotton productivity.

The experiences accumulated during this era laid the scientific foundation for Uzbekistan's cotton production system in the following decades and served as an important research-based pillar for the agrarian reforms carried out in the years of independence.

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