

## EMERGENCE, EVOLUTION, AND ECONOMIC SIGNIFICANCE OF FINE-FIBER COTTON VARIETIES IN THE COTTON SECTOR OF UZBEKISTAN

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**Abstract:** This article analyzes the emergence of fine-fiber cotton varieties in Uzbekistan's cotton sector, their formation process, and their role in the country's agricultural system. It provides information on the scientific research conducted during the Soviet period aimed at developing fine-fiber cotton production, including new directions in plant breeding and the creation of high-yielding and industrially significant varieties. Furthermore, the study highlights the importance of these varieties in enhancing the economic potential and export capacity of the textile industry. Based on historical sources, archival documents, and modern scientific research, the article examines key stages in the development of cotton production in Uzbekistan.

**Keywords:** Uzbekistan, cotton production, fine-fiber cotton, plant breeding, agrotechnics, textile industry, Soviet period, export, productivity, agricultural innovation.

Cotton has long held a strategic position in the economic life of Uzbekistan, serving as one of the most important agricultural crops whose various varieties have played a crucial role in the textile, technical, export, and consumer sectors. Prior to the Soviet period, coarse-fiber local varieties (such as “Tashkent-1” and “Bukhara-6”) were predominantly cultivated in the country, primarily to meet domestic needs. However, with the advancement of industry, the growing demand for textile products, and the expansion of national economic needs, the necessity to cultivate fine-fiber cotton varieties emerged.

Beginning in the early 1930s, under the initiative of the government of the Uzbek SSR, the selection of fine-fiber cotton was placed on a scientific basis. This process was closely associated with the activities of the Cotton Breeding and Seed Production Research Institute under the USSR People's Commissariat of Agriculture (later named after G.S. Zaytsev).

Prominent scientists of the institute such as G.S. Zaytsev, I.V. Rozanov, F.F. Abdukarimov, and M.R. Kholdorov developed new varieties adapted to Uzbekistan's climate, characterized by high fiber quality and resistance to diseases. Among these, the following varieties hold particular significance:

- 35-1 and 35-2 – early-maturing, moderately productive varieties that laid the foundation for fiber quality selection;
- 2836 and 10964 – high-yielding varieties with fiber lengths of 34–36 mm;
- S-6002, S-6022, S-6030 – industrially important varieties producing high-quality fiber suitable for export.

In the early 1930s, the selection of fine-fiber cotton in Uzbekistan was placed on a scientific basis. This process was closely associated with the establishment of the Cotton Breeding and Seed Production Research Institute under the USSR People's Commissariat of Agriculture (later named after G.S. Zaytsev).

The institute's activities were aimed at studying the biological characteristics of cotton, developing new hybrid varieties, conducting selection work adapted to different climatic zones, and creating a system for the production of high-quality seeds.

During this period, the first fine-fiber cotton varieties in Uzbekistan – such as 35-1, 35-2, 2836, and 10964 – were developed. Some of these were obtained through hybridization with



varieties from Iran and Turkmenistan, demonstrating high-quality indicators in terms of fiber length and strength.

During the Soviet period, agriculture was managed within a fully planned economic system. In the Second Five-Year Plan (1931–1935), Uzbekistan was assigned several key objectives: increasing cotton yields by 30 percent, expanding the cultivation area of fine-fiber varieties, establishing new breeding centers, and adapting fiber quality to industrial requirements.

As a result, by the late 1930s, the area under fine-fiber cotton in Uzbekistan exceeded 20,000 hectares. At the same time, breeding centers began operating in regions such as Tashkent, Bukhara, Kashkadarya, Surkhandarya, and Fergana.

During the years of World War II (1941–1945), the cotton sector acquired strategic importance. Cotton fiber served as a vital raw material for the military industry, being used in the production of parachute fabrics, medical bandages, military clothing, and technical textiles.

Despite wartime challenges, in the post-war period (1946–1950), the government of Uzbekistan and its scientists devoted significant attention to restoring cotton productivity and improving varieties. During these years, the following measures were implemented: testing and approval of new varieties; improvement of irrigation and land reclamation systems; and establishment of seed production stations and experimental fields.

By the late 1950s, fine-fiber varieties accounted for approximately 15 percent of Uzbekistan's total cotton production.

This period was marked by notable scientific achievements in cotton breeding. Prominent селекционер scientists such as G. S. Zaytsev, F. F. Abdukarimov, N. P. Mukhin, and A. Niyazov developed new disease-resistant varieties. Among the most well-known are S-6022, S-6030, and S-6035.

The S-6030 variety, in particular, held great significance due to its key characteristics:

- resistance to fusarium and verticillium wilt diseases;
- high yield (30–32 centners per hectare);
- fiber length of 36–37 mm;
- early maturity (ripening 3–5 days earlier than the 108-F variety).

In 1969, this variety was cultivated on only 1,000 hectares; by 1970, the area expanded to 18.5 thousand hectares, and by 1972 it exceeded 30 thousand hectares. These results turned Uzbekistan into a leading region in the Soviet Union for fine-fiber cotton production.

In the northern regions Sirdaryo Region and Tashkent Region—mainly medium-fiber cotton varieties were cultivated, as the relatively cooler climate did not always allow fine-fiber varieties to fully mature.

Fine-fiber cotton became a key raw material in the textile industry, used in the production of atlas, silk fabrics, technical yarns, cloth, and export-oriented goods. One ton of fine-fiber cotton was valued at 1.5–2 times higher than medium-fiber cotton. A portion of the production was exported to countries such as Czechoslovakia, Poland, Bulgaria, and Hungary. Based on Uzbek cotton, major textile combines operated in Tashkent, Fergana, Namangan, and Bukhara.

During the 1930s–1940s, these varieties were mainly tested in the southern regions Surxondaryo Region, Qashqadaryo Region, Bukhara Region, and Khorezm Region characterized by hot climates and sandy soils. The long vegetation period and high temperatures of these areas created optimal conditions for the full maturation of fine-fiber cotton.

If in 1929 these varieties were cultivated on only a few hundred hectares, by 1950 the area had reached 70 thousand hectares, and by 1970 it expanded to 220 thousand hectares. During this period, cotton production was recognized as one of the fastest-developing agricultural sectors among the southern republics of the Soviet Union. In the 1960s, breeders at the institute named after G. S. Zaytsev developed the S-6030 variety, which became one of the



most significant achievements in the history of Uzbek cotton breeding. This variety possessed several advantages: resistance to fusarium and verticillium wilt diseases; high yield (30–32 centners per hectare); fiber length of 35–37 mm, 15–20% finer than medium-fiber varieties; early maturity (opening 3–5 days earlier than the 108-F variety); and adaptability to both irrigated lands and partially arid conditions.

In 1969, this variety was cultivated experimentally on just 1,000 hectares; by 1970, the area expanded to 18.5 thousand hectares, and by 1972 it exceeded 30 thousand hectares. This rapid expansion ultimately positioned Uzbekistan as the leading republic in fine-fiber cotton production within the Soviet Union.

Scientists in Uzbekistan actively applied advanced breeding methods during 1950–1970, including genetic hybridization, crossbreeding, and strengthening disease resistance in cotton varieties. Fusarium-resistant varieties were developed based on hybrids such as “G‘arbiy-2836” and “S-6030”; early-maturing varieties were obtained from crosses like “Uzbekistan-1” and “Surxon-35”; and for the first time, a microbiological control system was introduced in the development of fungus-resistant varieties.

In addition, research laboratories at Tashkent Agricultural Institute and Samarkand State University conducted in-depth studies on the physiological growth cycle and biochemical characteristics of cotton. These scientific foundations provided a solid basis for the development of new cotton varieties in subsequent years.

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