

Chemical Composition of Cotton Fiber and Industrial Role of Production

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Abstract

In this article, the cultivation of promising cotton varieties in our country, its place in the world market, the chemical composition of cotton, its use in chemical and local industries, the products of cotton processing and fiber cleaning, and the role of cotton fiber in the production and textile industry. detailed information is provided.

Keywords: seed cotton, cotton fiber, cotton fiber composition, textile, cotton varieties, cotton gins, lint, cotton fluff.

Cotton cultivation in Uzbekistan occupies an important place in the national economy. It is one of the main raw materials of our country, and in 2006 it made up 17% of its exports. Our country ranks 8th in terms of cotton production and 11th in terms of cotton exports, with annual production of about 1 million tons of cotton (4-5% of world production) and export of 700-800 thousand tons (10% of world exports). In Uzbekistan, the second name of this product is defined as "white gold", and in fact, today it is demanded as the most expensive and necessary raw material in the world market. Let it be accepted for information that in 2022-2023, a subsidy of one million soums per hectare will be allocated from the State budget to increase soil fertility and cotton yield, to introduce scientifically based crop rotation and new irrigation technologies in 2022-2023. [1]

It is known that PQ-179 of the President of the Republic of Uzbekistan dated March 25, 2022 "On measures to increase soil fertility and productivity in cotton fields, to support the introduction of new irrigation technologies" It is being implemented in 13 districts provided for in the decision no.

Accordingly, in our country, we are making use of all the possibilities in the cultivation of promising cotton varieties. The role of cotton is very important for Uzbekistan, which ranks 82nd in the world in terms of economy. But its production has declined over the years.

Cotton production reached 8,000 bales in 1988, and was around 4,500 bales (1 million tons) by 2012. The reason for this downward trend is the high demand for growing food crops, which are the main demand. Its cotton is mainly exported to China, Bangladesh, Korea and Russia. Efforts have been made to develop the production of many cotton textile products in Uzbekistan by increasing the number of cotton processing industries and mills.[3]

Cotton, seeded cotton is the main product of cotton, consisting of fiber and seed. In the process of pre-treatment of cotton in a cotton gin, the main product for the needs of the textile industry - fiber (longer than 20 mm) is separated from the seed. Therefore, all over the world Cotton is evaluated according to the quality of the fiber. Lint (fluff) (less than 20 mm in diameter) is then extracted from the seed, which is used in chemical and local industries. In the process of cotton processing and fiber cleaning in technological equipment, dead (immature short-fiber fluff,

tangled fibers) and short cotton lint (less than 5.0 mm) come out. Cotton contains 30-35% fiber and 50-55% seed (24-29% oil in seed), 2-3% dead fiber, 3-5% short lint. Cotton is divided into medium-fiber and long-fiber types, depending on the type of selection of cotton and the thickness of the fiber. Cotton is picked by hand and by machine. Cotton fiber is divided into 5 industrial varieties according to the ripening coefficient and appearance, color, and 3 classes depending on the amount of impurities and moisture.[4]

Cotton fiber content (%): cellulose — 90.35— 94.6; water - 7; water-soluble substances - 0.5; incrustation substances - 0.75; oil and wax - 0.4; nitrogen substances -0.5; ash - 0.12. The fiber wall has a multi-layered structure (see photo). The outer layer, less than 1 μm thick, is called the first wall or cuticle (1-3). The cuticle is significantly different from the main cellulose wall in terms of its chemical composition and structure, and contains (in %) cellulose — 54, protein — 14, pectin — 9, wax — 8, ash — 3, cutin — 4. The chemical composition of different industrial varieties is also different.

It serves as a raw material for textiles, oil, hydrolysis, chemical industry and other sectors of the national economy.

Yarns spun from cotton fiber are exported to many foreign countries along with supplying the domestic market. It should also be noted that the production of fabrics from different fiber yarns is not at the level of demand.

Finished textile products (gauze, knitting, woven threads, etc.) are mainly produced from textile threads. Depending on the method of spinning the fibers, the name of the spun yarn is also different. Cotton fiber is spun in three different ways depending on its length.

- ★ Long fiber cotton (Lsht = 35 ^ 50 mm) is spun by the method of re-carding. The linear density of these threads is small (5 ^15.4tex), the thread is smooth and soft. It is used to obtain fine gauzes and bobbin threads used in the sewing industry.
- ★ Medium fiber cotton (Lsht = 26 ^34mm) is called carda yarn if it is spun by carda method. The linear density of Karda yarn is average (11.8-71.4 tex). These yarns are used to produce the main types of yarn.
- ★ Low-quality yarn spun from short fibers (Lsht = 18-30mm) by hardware method is called hardware yarn. The obtained thread is used to produce soft gauzes that retain heat well.

Cotton yarn spinning enterprises in Uzbekistan mainly produce yarn in the carding and carding system. Depending on the customer's request, it is produced either for knitting fabric, or for gauze, or for sewing threads. Depending on the type of fabric to be prepared, the customer can order yarns spun with a loop or without a loop (pneumomechanical). 9

Summary. In order to obtain quality products from cotton, the main attention should not be limited to the selection of a quality variety, but special attention should also be paid to the techniques and aggregates used in cultivation to obtain a high and high-quality harvest. Because in order to grow a quality product from cotton, it is important to plant the seed, primary and secondary processing, watering, fertilizing, inter-row processing and finally harvesting.

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