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Influence of Technological Procedures on Change of Various Fiber Damage

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ABSTRACT. In this article were described three versions of Sultan's selection cotton sort from various minor and major dirtiness, grew into fiber, and mechanical damage caused by various technological processes.

KEYWORDS: mechanical, biological and mixed injuries, the type of long-fiber selection

I. INTRODUCTION

Cotton is affected by various technological processes, from the cotton harvesting till the finished product. As a result, the quality of the yarn and fabrics can be impaired. As we know, fibers will have mechanical, biological and mixed damage [1-2]. If the technological processes are affected, the fiber will be mechanically damaged, and the biological damage will be caused by the appearance of various microorganisms the results for this may be: cotton storage, environmental temperatures, humidity and relative humidity of weather. If the amount of mechanical and biological damage to the fiber increases, the quality of the yarn obtained from cotton will be defected [3-5].

Cotton is harvested manually and mechanically. Fiber can be damaged by the process of collecting, storing and processing cotton seeds. For example, mechanical damage is caused by spindles during cotton-picking, transmission of cotton to subsequent technological processes, cleaning and separation of cotton from cotton seeds [6-7].

If the amount of damage increases than cotton fiber, the quality of the fiber and its products will be worsen, it means that the amount of mechanical damage will reduce the strength and length of the fiber, and the amount of short fiber will increase [8].

The index quality of the fiber is broken by mechanical impact on the cotton-picking and primary processing plants. The more damaged the fiber, the worse the quality of its finished product [9-10].

Several scientists have worked on cotton fiber damage, including AI Boyarkin, LN Balenky, MA Khojinova and others [2].

AI Boyarkin and LN Belenky have performed mechanical damage of cotton fiber on microscopic X-ray analysis. The results of the experiments have shown that mechanical damage to the fibers is very thin. In addition, they received an X-ray for mechanical damage of the fiber [3].

Testing by foreign scientists revealed that fiber breaks at the point of damage. After the fiber breaks, the length of the fiber decreases. In the result, the quality of the fiber will be worsen [1].

Additionally, the fibers will have visible, invisible damage. If mechanical damage to the fiber is apparent, the quality of the fiber will be impaired in the short process, and if the mechanical damage to the fiber is invisible, it may be caused by some technological process, such as spinning, twisting, twisting, twisting, or weaving. This negatively affects to the quality of finished products from raw materials [11].

Another surprizing pecularity of cotton fiber is its damage.

Taking cotton sorts 5595-V and Tashkent-1, scientists checked for damage to the fiber, and concluded the following. In case of cotton drying at 2000C, damage to long-range selection sort increased by 22% and for medium-fiber cotton sort increased by 24%. The erroneous methodology of this work is that the drying time is carried out identically[19].

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Mechanical damage to the fiber increases when the cotton dries dry at temperatures above 1600C. As a result, it leads to an increase in the number of short fibers, decreasing strength and length [1].

II. METHODOLOGY

In the cluster system cotton ginning plant, the fiber was determined from mechanical patching to rolling, on 2 variant from stripping to fiber cleaning, and on 3 version from cotton harvesting till balling process and the results of the tests are shown in Figures 1 and 3.

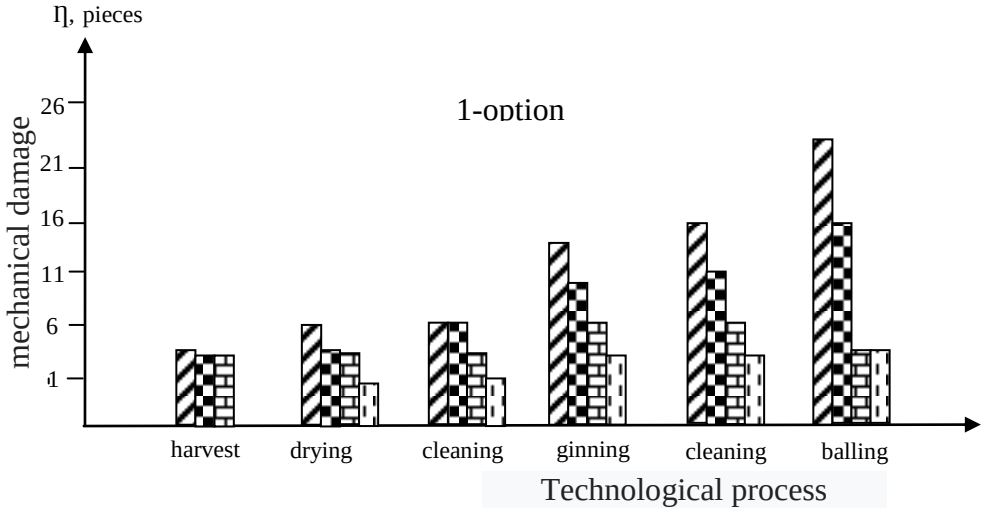

Figure 1.Impact of technological process on mechanical damage of fiber.

- common damage;
- fiber harvesting ratios 0-1;
- fiber harvesting ratios 1,5-2,5;
- fiber harvesting ratios 3-4;

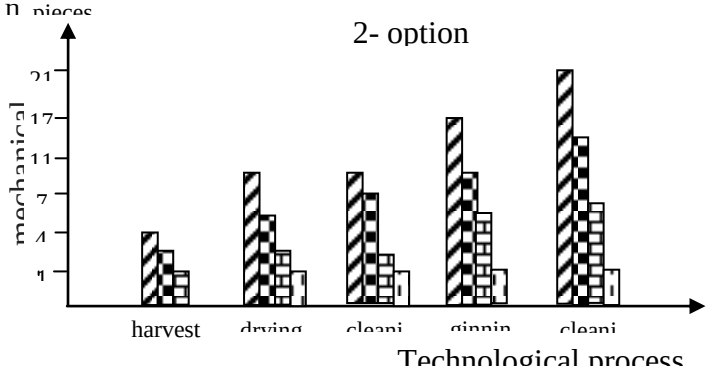

Figure 2. Impact of technological process on mechanical damage of fiber.

-common damage;
-fiber harvesting ratios 0-1;
-fiber harvesting ratios 1,5-2,5;

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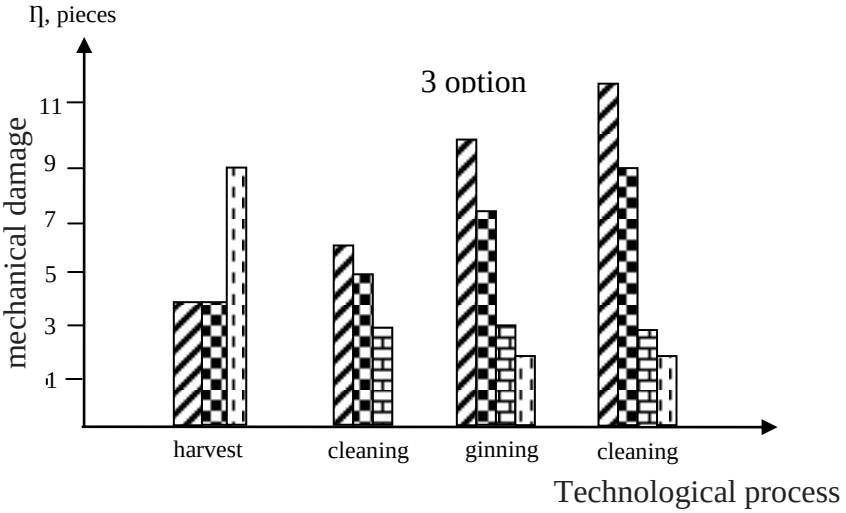

Figure 3.Impact of technological process on mechanical damage of fiber.

-common damage;
- fiber harvesting ratios 0-1;
-fiber harvesting ratios 1,5-2,5;
-fiber harvesting ratios 3-4.

III. RESULTS AND DISCUSSION

Analysis of the results of the study shows that, compared to the parameters of the cotton fiber of the first variant, the total mechanical damage of the fiber after the drying process is 42.8%, the total mechanical damage of the fiber after cleaning, 55.5%, the total mechanical damage after the ginning process. 75.0%, total mechanical damage of the fiber after cleaning, 77.0%, total mechanical damage of the fiber after balling, 82.6%, compared to the parameters of the cotton fiber in the second variant, the total mechanical damage of the fiber after the drying process is 55.5%, the total mechanical damage of the fiber after the cleaning process is 63.6%, and the overall mechanical damage to the fiber after welding is 76.0%; total mechanical damage of the fiber after the cleaning process is 80.0%, compared to the parameters of the fiber harvested by the third option, the total mechanical damage of the fiber after the cleaning process is 33.3%, and the total mechanical damage to the fiber after the welding process is 60.0%. , the total mechanical damage of the fiber increased after 66.7%.

If we initially use cotton from a variety of technological processes, especially if we keep the cotton in the stores for a long time, the amount of mechanical damage to the fiber will increase as a result of the drying and packing processes. For example, when drying and balling cotton, the fibers are subjected to mechanical damage under temperature and pressure. At present, it is advisable to reduce the flow of technological processes to enterprises cluster systems.

IV.CONCLUSION

The results of the research show that the more followness of technological processes are reduced, the mechanical damage of the fiber decreases from 77.0% to 66.7% after the fiber cleaning process.

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