MAIN RESULTS OF WORK ON THE PROCESS OF TRAPPING UNDERGENINED SEEDS AND VOLITALS OF RAW COTTON

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ABSTRACT. The article analyzes the scientific research conducted in order to reduce the hairiness of the seeds separated from the fiber. Then information was given about the device recommended by TsNIIXprom scientists to determine the hairiness of cotton seed. Finally, a relevant conclusion is given by determining the hairiness of cotton seed in several selection varieties.

KEYWORDS. cotton, seed, fiber, sorter, mesh surface, fine dirt, lint, fraction, damage, productivity, hairiness.

INTRODUCTION. When ginning cotton, depending on the adjustment and degree of gin nutrition, a different number of long, stranded fibers remain on the seeds of the same industrial and selection variety. On the seeds, the spinning fiber mostly remains in the form of individual braids of various sizes, both in length and width. Inside the roll box of the gin, the saw teeth come into contact with the cotton, forming a seed roller, for a distance of about 150 mm. Due to the significant difference in peripheral speeds between the seed roller and the saw cylinder, the capture and separation of cotton fibers from the seeds by saw teeth can occur at any point of their contact [1].

THE MAIN PART. If the fibers are captured and torn off by the teeth at the beginning of the contact of the saws with the seed roller, then when moving towards the grates they experience resistance from the frictional forces of the mass of the seed roller. This leads to the fact that some of the torn fibers slip out of the interdental blade of the saw and remain in the mass of the seed roller. Since this mass is sufficiently compacted, and its elements are continuously moving, individual fibers torn from the seeds and slipped out of the saw are wound onto the seeds, enveloping their surface. Some of these loosely enveloping fibers are subsequently captured again by the saw teeth and taken out of the roll box, while some remain on the seeds and come out of the machine with them.

On the seeds emerging from the gin in this way, two types of residual fibers remain - attached and loosely enveloping. To establish the standard for residual fiber content of seeds obtained after ginning, experimental studies were carried out. Based on experiments, he developed a method for determining the residual fiber content of seeds and established its standards. They recommend that when ginning grade, I raw cotton 108-F, the average rate of residual seed fiber should be reduced from 0.105 g to 0.08+0.005, which will make it possible to increase the fiber yield by 0.32%, and when ginning grade III raw cotton - For the first variety, it is proposed to reduce the average rate of residual seed fiber from 0.13 g to 0.095 g, which will lead to an increase in fiber yield by approximately 0.46% [2-6].

Another researcher in his scientific work to reduce fiber loss investigated the operation of a saw gin with the installation of different lengths of the seed comb. It has been established that with an increase in the seed comb, the gap between the comb and the grate decreases. As a result, the output of under-ginned seeds and cotton flakes from the roll box of the gin is reduced. However, this method reduces productivity by 20+30%, leads to the bareness of seedlings to a hairiness of 9+11% and reduces the quality of the fiber due to an increase in the content of short fiber (lint) and ginning defects.

In addition, such installation of the seed comb increases seed damage by 0.2-1.9%. Scientists looked at the effect of the position of the seed comb on the residual fiber of the seeds.

Another study says that when the seed comb is pressed, the seeds are exposed as much as possible and the speed of the seed roller decreases.

The author, studying the work of a saw gin in five positions of the seed comb, found that changing the position of the seed comb relative to the grate bars changes the productivity of the gin, the fibrousness and rotation speed of the seed roller, as well as the residual fibrousness of the seeds.

The author examined the influence of the thickness between the saw gaskets on the operation of the saw gin. He found that reducing the thickness between the saw gaskets from 18.45 mm to 16.35 mm facilitates the installation of 90 saw blades on

the saw, provides a reduction in fiber loss by 0.05-0.1% However, this also reduces productivity by 10-15 % and seed drop is reduced.

In the studies of others, the issue devoted to between the saw gaskets was considered. The author writes in his work that a change in the saw distance radically affects the quantitative and qualitative work of the gins. He, studying the distance between the saws, came to the following conclusion: a decrease in the distance between the saws significantly affects the residual fiber of the seeds - it will be lower than provided by the norm; in addition, it leads to an increase in fiber defects, both skins with fiber and broken seeds, and the mechanical damage of gynified seeds also increases, the quality of the fiber deteriorates, its length is shortened, the stability of the length is lost, and the density of the seed roller increases. This is because as the distance between dust decreases, the number of bare seeds and lint that ends up in the fiber increases in the seeds leaving the gin .

An increase in the cutting distance leads to an increase in the residual fiber of the seeds.

At cotton factories, the method for determining the residual fiber of seeds is based on taking into account the weight of the attached fibers remaining on 200 seeds. This method requires a lot of manual labor. Therefore, at present, when determining the residual fiber of seeds, a device developed by scientists from TsNIIkhprom is used (Fig. 1.).

The device consists of a cylindrical body (1), two rotating rollers with a diameter d_1 =30 mm (3) and a diameter d_2 =10 mm (2). When the device is operating, a sample of seeds with flakes is placed in the device (4), where they are moved by a turner (5). Seeds with long fibers are captured by rotating rollers, and the flakes torn off go to the bottom. The seeds are inside the chamber for 5-6 minutes. After the analysis is completed, the fibers are weighed and the residual fiber content of the seeds is determined.

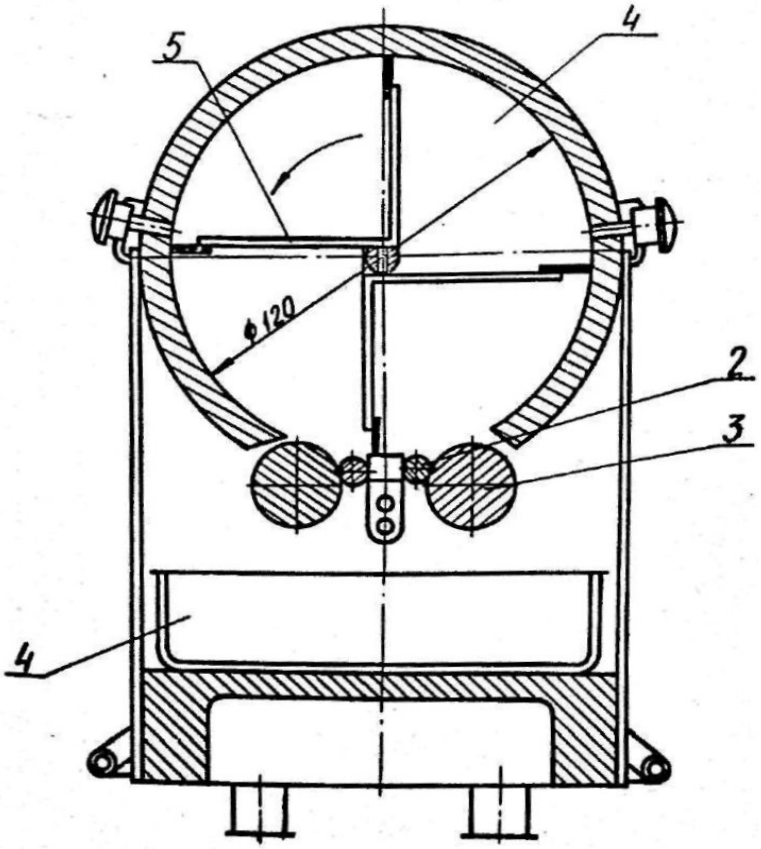

Fig.1. Scheme of the device for determining the residual fiber of seeds.

With the advent of new varieties, as well as the modernization of the technological equipment of cotton factories, the need arose to revise the existing standards for the residual fiber of ginned seeds.

In TsNIIkhprom research was carried out to develop and clarify standards for the residual fiber of cotton seeds after ginning for the new most widely zoned varieties of cotton, for which these standards had not previously been drawn up, as well as for some other varieties for which deviations from existing standards were noticed.

CONCLUSION. Based on the analysis and generalization of the research results and collected statistical data, as well as taking into account the specific biological properties and characteristics of raw cotton processing, changes were made to the current standards for the residual fiber of seeds after ginning. A study of the results of work on the study of residual fiber of cotton seeds showed that the complete elimination of loss of under-ginned gin from the working chamber .seeds

and flakes of raw cotton is practically impossible, so it is necessary to find another method for solving this problem.

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