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The Effect of Cleaning Equipment on the Amount of Defects and Waste in the Composition of Cotton Fiber

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ABSTRACT: In this article, in order to increase the cleaning efficiency of the machine for cleaning small defects in the laboratory of the department "Preliminary processing of cotton" instead of various surfaces were installed ribbed grid and determined the amount of defects and waste in cotton fiber

KEY WORDS: coarse impurities, bruised or injured seeds, dead, bark fibers, fine impurities, unripe fiber bundles, tangled and complex tangled fibers

INTRODUCTION

In the process of processing different selection varieties in cotton gins, that is, if they are not dried to the specified humidity during drying, if they are not well cleaned of impurities, then the amount of impurities in the fiber will be higher.

Defects and waste in cotton fiber are determined in accordance with UzDSt 632-2009. Cotton fiber is divided into high, good, medium, normal and bad classes according to pollution.

Foreign impurities in cotton fiber are also divided into mineral and organic in terms of their origin, just like impurities in cottonseed. These contaminants are considered to be impurities that are added to the fiber during the separation of the fiber from the seed, i.e., the separation of the fiber from the seed. In addition, in the process of separating the seed cotton, the gin machine causes additional dead and fine contaminants to form.

The effect of dead, crusty fibers, knots, and fine contaminants on fiber quality that remain after fiber spinning is very strong. They include large impurities, bruised or injured seeds, dead, bark fibers, fine impurities, unripe fiber bundles, tangled and complex tangled fiber mixtures.

In ginning enterprises, the process of cleaning cotton fiber from defects and waste is carried out before pressing and spinning of fiber. If the amount of defects and waste in the fiber content exceeds the norm specified in the state standard, and they are pressed and pressed, it will make the operation of the equipment of the preparation departments in textile enterprises somewhat difficult. In addition, cotton fibers become more tangled, excessively wasted in textile mills, and lead to an increase in waste. Therefore, in cotton gins, good cleaning of each selection variety leads to good results.

Moisture plays an important role in the efficiency of cleaning of cotton fiber in ginneries. For example, if the moisture content of the fiber is higher than the standard values, then the fiber is not well cleaned of defects and waste.

The impact of different types of seed cotton on technological processes, which are initially processed in ginneries, varies. For example, some selection varieties are well cleaned of fine and coarse contaminants in the cotton, while others are the opposite. Therefore, it is necessary to create optimal conditions for each selection variety grown in the country. Failure to do so may result in adverse effects affecting fiber and seed quality.

Therefore, if some selection varieties are not cleaned well, they will need to be cleaned several times. In addition, the seeds of some selection varieties are brittle and there is a possibility of injury under the influence of technological

processes. At the same time, if the amount of cortical fiber and nodules due to harmful defects in the fiber content increases, then the quality of the finished products from the fiber will deteriorate.

II. METHODOLOGY

Therefore, research work has been carried out to improve the pile threshing drums located on the equipment for cleaning cotton seed from small contaminants in ginneries. By changing the movement of the seed cotton between the proposed pile drum and the mesh surface, the efficient use of the mesh surface is to distribute the moving cotton evenly throughout the surface, not only in the center, and as a result increase cost-effective cleaning efficiency and equipment efficiency. It follows that it is possible to increase the cleaning efficiency of the equipment by changing the appearance of the nets on the pile drum of the 1XK small defect cleaning equipment.

Therefore, after the improvement of the working parts of the 1XK cleaning equipment for cleaning small defects in the ginning plant, after the ZOVP fiber cleaning equipment, samples were taken and the amount of defects and waste in the cotton fiber was determined manually in the laboratory. The results of research on laboratory determination of the amount of defects and waste in the fiber obtained from the ginning equipment 1XK available at the ginnery are presented in Table 1.

Table 1
Defective cotton fiber and cleaning to change the amount of waste
effect of equipment

variet ies	Containing cotton fiber defects and waste amount, %	Types of defects by appearance, %					
		flagella	combined flagella	broken and pressure seeds	peel with fiber	nodules	Weedi- ness
imperfect equipment							
I	2,83	-	-	0,22	0,39	0,14	2,08
improved equipment							
I	2,53	-	-	0,26	0,34	0,10	1,83

Based on the results in Table 1, Figures 1-2 show histograms of changes in the amount of bruised or injured seeds, bark fiber, impurities, and total defects and wastes.

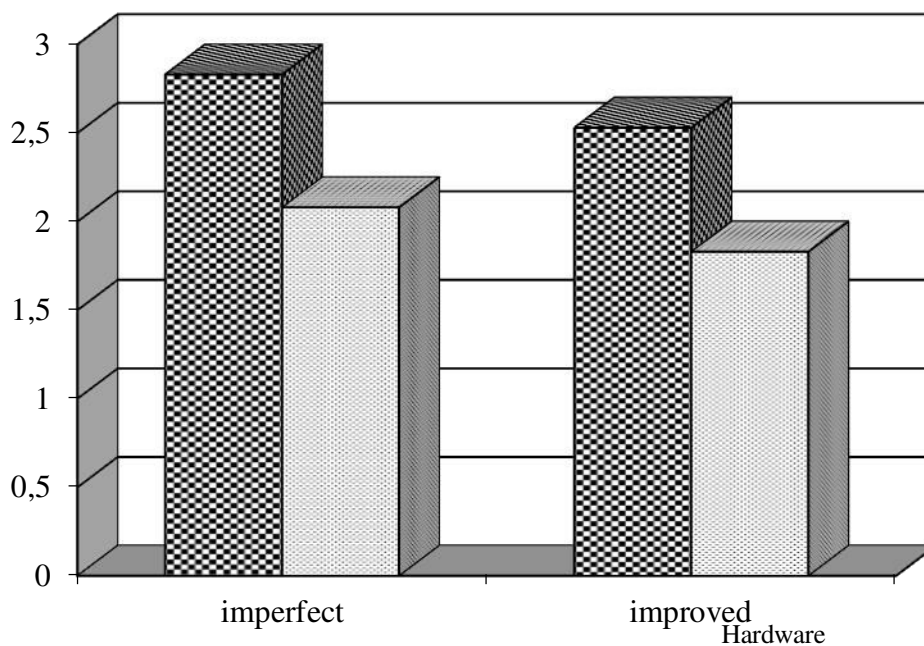




Figure 1. The general defect in the cotton fiber content and the effect of the cleaning equipment on the change in the amount of waste and contaminants.

 - containing cotton fiber defects and waste amount;
 - weediness

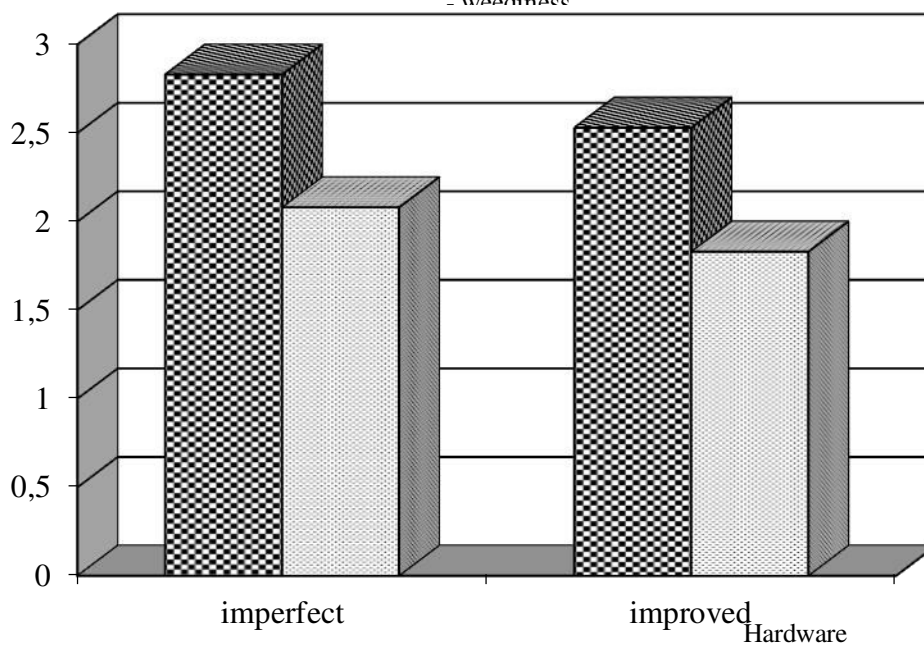




Figure 2. Effect of cleaning equipment on changes in the amount of beaten or injured seeds and husk fiber in cotton fiber.

 - broken and pressure seeds;
 - peel with fiber.



III. RESULTS AND DISCUSSION

Comparing the test results with the results from the imperfect equipment, the total fiber content and waste obtained after the improved equipment decreased by 10.6%, the amount of impurities decreased by 12.1%, the amount of hit or injured seeds increased by 15.4%. fiber content decreased by 12.8%.

The results of the research show that after the improvement of the equipment for cleaning small defects, it was found that the degree of cleaning from the amount of defects and waste in the cotton fiber is good. This is because the movement of the seed cotton slows down during cleaning, and the cleaning efficiency increases.

For example, if the moisture content of cotton is lower than the standard values, the quality of fiber and seeds will deteriorate, on the contrary, its cleaning efficiency from small and large contaminants will be higher. Therefore, optimal conditions for drying cotton seed are developed in ginneries.

IV. CONCLUSION

In summary, compared to the results obtained from the improved equipment, the total amount of fiber defects and waste after the improved equipment decreased by 10.6%, the amount of impurities decreased by 12.1%, the amount of hit or injured seeds increased by 15.4%, the amount of bark fiber Decreased by 12.8%.

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